The Builder.

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Two Views of Gothic Architecture.

AT the early period of the Gothic revival it was a generally accepted idea that the pointed arch was the great characteristic of the style, and that Gothic architecture was essentially [the architecture of picturesque and informal composition and detail, as opposed to the complete symmetry, both in general mass and in detail, of Classic architecture. In process of time both opinions were considerably modified. It was gradually perceived that as far as general architectural feeling and general principles of treatment and structure were concerned, the essential character of Gothic architecture might be as well represented in a round-arch as in a pointed-arch building; the pointed arch was indeed mechanically required to carry out the system of vaulting in a complete and elaborate manner, but that was really a matter of detail of structure and design rather than of principle. The idea that Gothic was in a particular sense a non-symmetrical architecture was also modified by degrees, and especially by greater acquaintance with Continental examples. It was recognised that while Gothic would bear a freedom of treatment and an absence of symmetry which would be impossible under the more conventional system of Classic and Renaissance design, a building might nevertheless be completely and typically Gothic and yet be as regular in design and setting out as a Greek temple.

In fact, the first conception of the Gothic revival was a purely insular one, and the classification and nomenclature of Rickman, which was the foundation of all others and which has in a great measure been permanently adopted, was based entirely on English examples, and took into account, as essential types, two phases or styles, Early English and Tudor, which do not exist at all out of this country. The very idea of the irregularity and want of symmetry of Gothic was in a great measure founded on the fact that our English cathedrals are mostly conglomerations of work carried out at different times and in different manners; the result of want of funds and of resources for carrying out the building faster. In France, where greater resources were concentrated on cathedral building, and where in any case the changes in style were fewer and less marked than in England, there is no lack of examples carried out in one style throughout, distinguished by a much more homogeneous character and a much greater symmetry of design than is usual in England, presenting a Gothic architecture of severer and more logical consistency, and on this account not without a valid claim to be regarded as the central and dominant type of the style. It was going a good deal too far however when an American writer, Mr. Moore, impelled partly by that desire to glorify everything French which characterises modern American art-criticism, assumed, (in a book of which a second and enlarged edition has just been issued,) that there was no Gothic but French Gothic, and that English work was of no serious account. This was bringing the wheel full circle, certainly. We first revived the study of Gothic in this country and from a purely insular standpoint, taking English Gothic as the basis of our classification. Now we were invited to go to the opposite extreme, and regard English mediæval architecture as a mere kind of picturesque haphazard, wanting the main qualities which constitute Gothic architecture.

It is, apparently, partly as a counterblast to this heresy that Mr. Prior's book on English Gothic Architecture* has been written. It is the most important work on the subject produced in this country for some time; and, of books which are literature and not mere albums, may be said to be quite the best illustrated book of the kind that has been published, as might be expected from the fact that Mr. Horsley's exceptional talent has been employed on this department of the work. The author's aim has been "to exhibit the broad impulse of design as being the vital expression of English Gothic," and to vindicate the English style "as a true line of Gothic creation, native in its origin and its progress, and separate by its qualities from the Continental styles." Although we quite agree with the general position, this expression of it is hardly quite accurate, for unless we regard English history as beginning with the Norman Conquest, it must be admitted that the English Cathedral architecture as we know it was commenced by the Norman invaders,* though it soon took on a local character distinguishing it from Continental work. And as to it being "separate by its qualities from the Continental styles," it is hardly worth while to argue that point, since that is exactly what the Gallicising critics themselves insist upon. But to say that the Norman invaders started the style in England is one thing; it is quite another, as Mr. Prior says, to maintain that "our English styles were at their starting always mere borrowings, and that constant reinforcement was necessary to enable us to produce Gothic at all;" and we are glad to notice that a page or two further on the author remarks how "Edmund Sharpe long pointed out the early features of our Transitional Gothic as distinct from those abroad," and comments on the undeserved neglect which has fallen on Sharpe's suggestions, "many of which showed a greater understanding of the Gothic story than what has been lately accepted." Indeed, to those who knew Sharpe and are acquainted with his works on Gothic architecture, and the thoroughness of his study and illustration, it is almost amusing (in a painful kind of way) to notice the utter ignorance of them which prevails among the younger generation of students of architecture.

By way of laying the foundation of his

* "A History of Gothic Art in England." By Edward S. Prior, M.A., with illustrations by Gerald C. Horsley. London: George Bell & Sons. 1900.

* We have before shown that the theory of Waltham nave being the pre-Norman Church is totally untenable. Whatever a Saxon cathedral was like, there is no reason to suppose that it was much like the Norman architecture, or that the latter was other than an exotic at the time of the Conquest.

denial of the French origin of English Gothic Mr. Prior gives a significant map of France and England between 1154 and 1199, showing that Normandy, Maine, and Anjou were then under the government of the English kings, and that England could not therefore take a lesson in Ile-de-France Gothic from these territories. He observes:—

"The vivid distinction of the Ile-de-France Gothic must always be acknowledged, but it was a distinction coincident with the political growth of the kingdom of France under the great reign of Philip Augustus. At the time of those beginnings the France *royale*, which was the mother of the great Gothic architecture, did not include within its boundaries those sources which the writers, whom we have summarised above, have called promiscuously French, whether they be Burgundian or Norman, or Angevine. The Ile-de-France Gothic grew up one among others, but, as it happened, neither Burgundy nor Normandy, neither Caen nor Citeaux, was yet part of the royal domain of France, when the English Gothic style had taken a way of its own—when St. Hugh was building Lincoln and De Lucy the Winchester Chapels—when Wells and Glastonbury were rising in the west, when Archbishop Roger had finished at Ripon and York, and Bishop Pudsey at Darlington and Auckland; and works like these must be allowed to be as conspicuously English in their Gothic as Nôtre Dame or Chartres are French."

This was a point worth making certainly, and puts the subject of the relation between French and English Gothic in rather a new light. At the same time it must be remembered that architectural influence is not entirely dependent on political influence; propinquity does something; buildings in neighbouring provinces will show similar architectural tendencies in spite of their being under different governments. Nor does the author's argument, to our mind, at all traverse the position that Gothic architecture originally radiated to this country from France, with the Norman Conquest. Once here, we quite agree that it took a line of its own, and had an indigenous development little depending on outside influence. Indeed, the argument of such Frenchifying critics as Mr. Moore seems to answer itself. In one breath we are told that English Gothic was entirely dependent on French influence. In another we are told that English is not true Gothic because it is radically different in principle and in structural design from French, which latter is the true and complete style. The two propositions are obviously contradictory.

Nevertheless, in the second and greatly enlarged edition of his book* Mr. Moore completely adheres to his original view, that French Gothic alone represents Gothic architecture in the true sense, because it alone shows (in certain examples at all events) complete logical expression of structure in the design. In fact, Gothic architecture means to Mr. Moore the Cathedral of Amiens, and little else. We need not go again through this reasoning, which we have fully considered in a review of the first edition of the book. The author can still see nothing in such a composition as the west front of Peterborough. That it has no direct relation to the structure in its rear is true enough, but in saying that "the composition as a whole is as unhappy in architectural effect as illogical in its adjustment to the building," Mr. Moore is probably, and fortunately, alone among architectural critics. "The west front in England is," we are told, "as a rule devoid of Gothic character, which imperatively demands a logical adjustment of part to part." And yet on another page we read—"Irregularities are, in fact, inherent in the Gothic system, which in this respect resembles nature itself, where a vital principle seems to operate to prevent perfect uniformity in the development of organic forms." The parallel is a false one, for natural forms which actually move or grow are under different laws and conditions from a building, which is a structure built up of dead materials in accordance with conditions of statical equilibrium; but whether good or bad, it gives away a great deal of the author's position. The fact is that, with Mr. Moore, the real consideration is whether the class of irregularities referred to occur in French or in English architecture. If French, they are to be admired, as an evidence of the utility of Gothic; if English, they are to be condemned, as evidences that the English builders did not understand the true principles of Gothic. In the chapter on "Profiles in England" he persists in his extraordinary statement that the Early English uncarved capital "is rarely a capital of good profile," and in his preposterous drawing (p. 345) of a thing which he has the assurance to give as a typical illustration of this form of capital. What is really at the bottom of this is that the Early English capital is a peculiarly English feature, not found in French Gothic, and hence to be scouted. The whole chapter on English profiles does no justice to the variety and effectiveness of English mouldings, in which respect at all events English Gothic is far superior to French, where the mouldings have far more similarity, less effect of light and shadow and much less delicacy in the profile design—a quality which, as in Greek work, speaks perhaps more than anything else for the refinement of taste of the builders.

It seems a pity that Mr. Moore did not confine his book to the subject which he most understands and sympathises with, and entitle it frankly a book on "French Gothic," leaving other varieties of the style out of consideration. He would then no doubt have produced a smaller but more valuable book, the title of which would have represented its real contents. As it is, the whole scheme is vitiated by the fact of his having linked his really excellent and appreciative analysis of French Gothic with chapters on the Gothic of other countries, the whole object of which seems to be to depreciate and misrepresent them in order to fortify a previously adopted conclusion.

It is of course quite true that French Gothic presents a more complete illustration of what may be taken to be the logical result of the gradual process of transformation by which the Gothic vaulted compartment was developed from the Roman, viz., the practical suppression of the wall between the buttresses, or the treatment of the buttresses as the wall turned edgeways. Fergusson was, we believe, the first to point out clearly this *ultima ratio* of buttress architecture; a piece of critical insight for which he has hardly received due credit. This frank acceptance of the position of the buttress, at right angles to the axis of the building, as the real and only supporting wall, gives no doubt a special unity and force of effect to French Gothic; but it may be fairly considered whether this is not at the cost of a want of repose, and whether the typical French cathedral, with its immense buttresses at angles to the building, and the generally double tiers of flying buttresses to carry the thrust of the vault to them, does not partake too much of the character of lithic scaffolding rather than architecture. Logic, after all, is not everything in architecture. The English builders, giving less development to the buttress, retained for the most part of a considerable measure of solidity in the intermediate wall. This, which Mr. Moore of course considers a defect of our buildings, is commented on also by Mr. Prior in an admirable passage (p. 206-7), as showing how the habits of Romanesque origin clung to the path of English Gothic art. After speaking of Salisbury as especially exemplifying this, with its short vaulting shafts attached to the triforium stage, he continues:—

"And even Lincoln, with all its lightness and the energy of its aspiration, leans in large measure on the older art. Though Romanesque solidity has been refined away, the vault, sharp as it is, and buttressed by 'flying' support, is still only a ceiling articulated to the wall, not to the ground. The Norman divisionings of ground story,* upfloor, and attic, range the wall into an expression of solid continuance; the inclosure is no screen stretched between the pillars of the vaulting, but a structure of mass that stands under its burden."

Architecturally, is it the worse for that? And do not the immense high-shouldering buttresses and the clouds of flying buttresses of the French cathedral partake, after all, a little too much of the nature of engineering rather than architecture, the primary object of which is beauty? We may admit that the exterior treatment of the flying buttress in the Presbytery of Lincoln, given as an illustration by Mr. Moore at p. 225 of his book, is feeble, especially in the way the flying buttress abuts against a narrow space between two wall-arches; but look at the view of the interior of the clearstory and the head of the triforium arcade on the opposite page, and it may surely be asked whether any one of the illustrations from French Gothic given by the author shows as beautiful and graceful a piece of design as this.

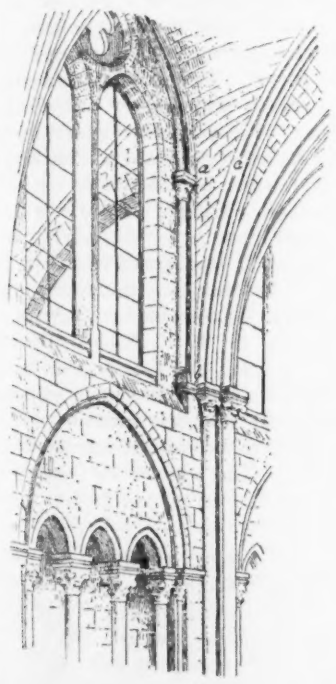
The treatment of the west end is another point of essential difference between French and English Gothic, in regard to which Mr. Moore accuses the English builders of utter want of logic. It may be replied that, however that may be, they showed at all events a greater amount of fancy and invention than the French, whose cathedral façades seem to have but one general idea—the two towers, the gable between, and the three doorways, while nearly every one of our principal cathedral fronts has a character and design of its own. No one can admire the western façade of the Paris Cathedral more than we do, but is there to be no other type? and are we to be asked to consider (as we were in a weak amateur work on our cathedrals by an American lady some little time ago) that York Minster is our finest western façade, simply because it is on the French type? For that is what it really comes to. As to the illogical nature of the screen treatment at Lincoln, for instance, the weak outline of the sloped roofs of the aisles

* "Development and Character of Gothic Architecture." By Charles Herbert Moore. Second Edition, rewritten and enlarged. New York: The Macmillan Company; London: Macmillan & Co. 1899.

* Mr. Prior writes "storey," against which we protest. It is a spelling of no philological authenticity.

has got to be masked somehow; in France it is masked by towers; in England in some instances by a screen. We do not see that the one method is less defensible than the other. Peterborough indeed is something more than a screen—it is an erection in front of the front, and therefore in the eyes of the American critic a sin. Well, it is a licence of genius which the French may very well envy us, and which we may be thankful to possess.

Before quitting Mr. Moore's "Second Edition" we may refer to one point in it, his theory as to the cause of the frequent stilting of the springing of the longitudinal or wall-rib of a vault. He maintains that it was not to get the rib out of the way of the clearstory window, and leave more space for the latter, but to concentrate the thrust of the vault more completely on the flying buttress, by cutting back the vaulting surface into the well-known "ploughshare" form, the surface filling being supposed to convey the thrust of the haunch of the diagonal rib towards the point of impingement of the flying buttress. This is an ingenious theory, but rather far-fetched and very doubtful. The argument used in its favour is that it is employed in France before the clearstory window had attained such dimensions as to fill the space between the vaulting ribs. But the very example he gives, from St. Leu d'Esserent, contradicts the



theory. The longitudinal rib, if sprung from the same level as the others, would obviously cut into that window; and the whole appearance of the design conveys on its face the impression that the window had been the main element in this part of the problem. The theory is a piece of critical *finesse* which does not carry conviction with it, at all events from this example. We must have "a more sounder instance."

To return to Mr. Prior's book, we may notice as among the most interesting and valuable portions of it the history and illustrations of the development of the English church plan, which he regards as bearing a threefold impress—the tradition of ancient oblong chambers of the Irish type, "descendants, we may conceive, of the room still shown in Rome where St. Peter ministered; secondly, the Roman basilican type of imperial Christianity; and then, mingled with both, the ambition of the cross church of later monastic development." The series of plans given to illustrate this development form a most interesting set for comparison. The ideals of the French and English cathedrals are well contrasted. "Inside Nôtre Dame is a compacted hall, where height, breadth, and length, all seen together, are the elements of effect, to the distinctness of which everything is sacrificed. In the English cathedral there is the mystery of a series of chambers never completely seen together, broken by screens and lengthening themselves with further recesses." The grouping of the whole great subject is very well carried out. Following the chapter on the English church plan is one on the style of the Transition in England, then "The Greater Building of the Thirteenth Century"; "The Lesser Building of the Thirteenth Century"; "The Detail and Sculpture" of the same period; followed by a chapter on "The Summit of Gothic Art," which the author regards as being found in the earlier Decorated or Geometrical style. This opinion is a return to that formerly entertained by the best students of English Gothic architecture, and which has been for some time out of fashion; but we believe it is a right and sound one. At no other period of our architecture was so perfect a balance achieved between breadth and solidity of general treatment and richness, without over-exuberance, of decorative detail. These are followed by chapters on the building and on the decoration and sculpture of the fourteenth century, and on Gothic architecture after 1350.

It is to be regretted that the author thinks it necessary, in upholding the theory that mediæval building was essentially a spontaneous evolution of the art of the people, to be constantly gibing at "architects," a word which he usually introduces in contemptuous quotation commas, and to introduce a sneer at "our exhibition sculptors," by way of suggesting that mediæval sculpture was something far superior. Mediæval sculpture was no doubt part and parcel of the general architectural effect, in a way that sculpture seldom is now; but that is hardly the fault of the sculptors; and if Mr. Prior means to suggest that the works of M. Mercié and M. Boucher, for instance, or of Mr. Gilbert or Mr. Onslow Ford, are inferior to those of the decorative mediæval sculptures, we take that to be simply nonsense. Only sculpture is now an individual art, and must be looked at and judged from that point of view. In his desire to ridicule "restoration" (in which in one sense we are quite with him) he goes to unreasonable lengths—in his remarks, for instance, on the substitution of a more durable marble for the decayed lias shafting on the front of Wells. Does he realise the extent to which that old shafting was decayed? Any one who went over the scaffolding and saw from a close inspection the extraordinary state of decay of the ancient shafts and abaci, which were like wood in the last stage of rottenness and splinters, would surely have said that to replace them (and they had to be replaced or they would have come down) with the same stone which had shown such liability to decay, would have been want of common sense. As to the question of "architects," if the name did not exist in the middle ages, the personage did. If Peterborough front is not essentially the work of an architect, as distinguished from a mason, we know nothing in the world that is.

Nevertheless, this is a notable book—one of the best contributions to architectural literature, criticism, and illustration, which has been made for some time; a book that no one interested in architecture can afford to overlook.

NOTES.

No. 17, Fleet-street.

We are very glad that the London County Council, after a sharp debate in the course of which some rather foolish things were said, have decided, though by a small majority, to secure the historic house forming No. 17 Fleet-street in perpetuity. The decision is gratifying not only in reference to the immediate case, but as establishing a precedent in favour of recognising the historic and educational value of ancient London buildings as something worth paying for; and we think that the public will support the action of the Council. We feel bound to express especially our appreciation of the tone of Mr. John Burns's speech in support of the purchase, and his remark that "the decadence of any city could be measured by its contempt for such memorials." In regard to this and other similar questions Mr. Burns has shown a largeness of view and a sense of the importance of architecture, whether ancient or modern, to a nation, which is unfortunately unusual in this country, and for which he merits the thanks of those who are specially concerned with this side of our national life.

Delay by Sub-Contractor.

The case of Leslie & Co., Limited, *v.* The Managers of the Metropolitan Asylum District is not without interest, though the facts are somewhat voluminous. The long and the short of the dispute was that the defendants had the option of employing special firms for special kinds of work, though the plaintiffs were the actual contractors. But it was an option only, and it was not exercised, the plaintiffs entering into the contract with these special firms. By them delay was caused, and the defendants were said by the plaintiffs to be liable. It is difficult to understand this contention. The sub-contracts had been made by the plaintiffs, and it was in their power to guard themselves against the consequences of delay on the part of the sub-contractors. The business moral of the case is that the principal contractors cannot make the building owner liable for the delay of sub-contractors under a form of contract which does no more than give an option to the building owner to employ certain specialists.

Electrical Installation Rules.

We have received a copy of the new edition of "Electrical Installation Rules" issued by the Liverpool and London and Globe Insurance Company. It is now definitely stated that for all ordinary risks, such as dwelling-houses, office premises, &c., installations which conform to the general rules of the Institution of Electrical Engineers will be allowed without alteration being required and at current rates. This is a very

satisfactory announcement, and we hope that other insurance companies will also accept them. The multiplicity of rules hitherto prevailing, some of which contradict one another, has oftener been a source of vexation than a help to the conscientious electrician. He will, therefore, welcome these rules, which are manifestly written to be useful to him. The supplement on "Special Risks" has been considerably enlarged. The rules for electricity supply works are interesting reading, but we expect that insurance companies will be more chary than ever about taking on those risks after the recent disastrous fires in London. We are glad that the company recommend a simple earth leakage detector for large private installations. They give details of a simple and inexpensive method which we have found quite satisfactory in practice. Two lamps are put in series across the mains at the switchboard, and the line between them is connected to earth by a switch. When this switch is closed and the lamps are turned on, then the lamp on the side opposite the one on which the leakage occurs will be the brighter. If both mains are equally leaky, then both lamps will glow more brightly when the earth switch is closed. As the whole test need only take a quarter of a minute, it is a valuable one, and ought to lead to periodic testing. Unfortunately, this test fails for installations supplied from the street mains. In this case, we are afraid that testing and inspection only occur when something goes wrong.

Recent Hydraulic Experiments.

RULES used for computing the flow of water in pipes have an intensely scientific appearance, and are ostensibly based upon theoretical principles. As a matter of fact, however, none of them are of the slightest use unless qualified by indices selected by the operator from experimental data. Engineers who have had the benefit of considerable practice in hydraulic work are apt to be somewhat distrustful of the most carefully designed formulas, and we are, therefore, glad to notice in the proceedings of the American Society of Civil Engineers an account of some recent experiments upon the flow of water in large pipes. The experiments in question were made upon the 6 ft. steel pipe line of the Pioneer Electric Power Company, Ogden, and their object was to determine the relation between the mean velocity of flow and the loss of head between certain definite points. From each observation group the values of the following quantities have been computed:—Loss of head per 1,000 ft., co-efficient, c, in the Chezy formula; and the co-efficient of roughness, n, in Kutter's formula. These values were plotted with mean velocity of flow, v, as abscissæ; mean curves were drawn representing each of the quantities as a function of the velocity, and from the mean curves a generalised table was computed. According to this table the Chezy co-efficient c shows a considerable increase with the velocity up to 2·5 ft. per second, above which the increase is slow. The Kutter co-efficient n shows, for low velocities, a decrease with increasing velocity. Thus it would appear that rules ordinarily used for computing flows at low velocities require the most careful treatment if serious errors are to be avoided. The ordinary assumption that the roughness of a given pipe is a fixed quantity seems to be entirely reasonable, but the experiments to which we refer imply that decrease of velocity may considerably increase the practical manifestation of roughness, although the actual condition of the pipe surface remains unaltered. Some further explanations are promised, which it is said will indicate in what manner the accuracy of these novel results may be verified. Engineers will doubtless welcome any information tending to encourage exactitude, even if existing mathematical complications are to be intensified.

The Filtration of Crude Sewage.

THE supplementary report by Dr. Clowes and Dr. Houston on the filtration of crude London Sewage is practically a confession of failure. The surface of each piece of coke soon became coated with soft matter—consisting largely of fine particles of chaff, straw, cotton and woollen fibres, &c.—which increased at such a rate as to diminish the capacity of the filter 1 per cent. of its original capacity per week. In other words, a coke filter of the kind tested would be choked by crude sewage in about two years, and long before the expiration of that period its purifying power would be reduced so much as to render the filter almost useless. By passing the sewage along a trough, in which cross-divisions were placed from the bottom to about half the height of the floor, much of the objectionable matter was prevented from entering the filter, and a similar result was obtained by passing the sewage through a tank. The experiments with the sedimentation-troughs are to be continued, but we cannot see that they will prove of much value. Among the bacteria discovered by Dr. Houston in the deposit on the coke were some which could not be distinguished from the tubercle-bacillus, and in one case a guinea-pig, into which some of the deposit had been injected, died from tuberculosis. The general result of the investigations is a confirmation of the usual method of bacterial purification, which includes sedimentation and initial purification in tanks before the sewage is passed on to the filters.

Water-Closet Cisterns.

THE architects of Hull, by the agency of a deputation to the Hull Corporation Water and Gas Works Committee, have objected strongly, and rightly, to the new by-law proposed by the Corporation limiting the contents of flushing cisterns for water-closets to two gallons. In regard to the precedent unfortunately furnished by London in this respect, they expressed the opinion that a two-gallon flush would never have been legalised for London if it had not been for the monopoly exercised by the Water Companies—a conclusion in which they are probably quite right. We never understood how that by-law came to be passed for London, considering that the weight of expert evidence was entirely against it. The Hull architects are doing right in taking the matter up strongly, and we hope they will be successful.

St. Thomas's Hospital, Gravesend.

MESSRS. FARROW & NISBETT have prepared plans and designs for rebuilding the almshouses, otherwise known as "Pinnock's Charity," for the trustees of the endowment. The hospital was founded by Henry Pinnock (1624) and James Fry (1710) on behalf of the poor parishioners of Milton and Gravesend; sixteen almshouses were built in 1836, the endowment consisting mainly of 5 acres of fresh and salt marshland in Gray's Thurrock, Essex.

Westwood Park, Worcestershire.

LORD HAMPTON is about to sell his freehold estate of Westwood Park, extending over 3,080 acres, near Droitwich, and yielding a rent-roll of about 2,400*l.* per annum. The mansion, which stands upon an eminence affording fine views of the Malvern, Bredon, Clent, and Abberley Hills, was built by Sir John Pakington, Knt. (*obiit* 1625), the "lusty Pakington," *temp.* Queen Elizabeth, and described by Fuller as "a fine but no assiduous courtier." The house, which is similar in appearance to Holland House, Kensington, is constructed of red brick. It consists of a square block, four stories in height, with wings, of the same elevation, that extend diagonally from each angle; at the end of each wing was added, in 1592, a square tower with continuous oriels in each front, and an open parapet and a lofty pyramidical roof. At a short distance from the wings were small brick towers with quaintly curved roofs. From the north side projects the private chapel, renovated by P. C. Hardwick in or about 1850. The hall, measuring 58 ft. by 30 ft., and 17 ft. high, has four large bays, above it is a drawing-room, to the same plan, with a decorated fireplace and a panelled ceiling of the period. The carved oak staircase has a balustrade with globes and Corinthian columns. The property originally belonged to the Benedictine nunnery of St. Mary the Virgin, founded by Eustacia de Say and her son Osbert Fitzhugh, *temp.* Henry II., and was given by them to Fontevrault. At the Dissolution it was granted by Henry VIII. to Sir John Pakington, Knt. (*obiit* 1560), the revenues being computed at 78*l.* yearly. The two views in T. R. Nash's "Worcestershire," 2 vols., fol., 1781-9, show the four small towers with their curtain walls (since demolished) and the present gate-house, with its open wood-work, opposite the main entrance. The site of the nunnery was converted into the kitchen garden.

Messrs. Tooth & Sons' Gallery.

THE exhibition at Messrs. Tooth & Sons' Gallery is worth visiting if it were only to see Millais's fine and poetic picture, "Time" (81), exhibited some years ago at the New Gallery. Among the other attractions of the collection is a small but remarkably fine landscape by Alfred Hunt, "Llyn Idwill" (60). Various landscapes by C. Jacque, though a little too obviously the revival of an old style of landscape-painting, in which local colour is evaded, have a fine classic style about them. A small interior by F. Ejsmond (a name new to us), under the title "Hard Times" (83) is noteworthy for the fine and minutely-finished painting of the figures, that of the woman especially. Ter Meulen's "Sheep Washing" (89) is a broadly-painted pastoral in his best manner. A very good specimen of the work of the late E. W. Cooke—"Dutch Pinks Waiting Return of Tide" (99), forms an interesting reminder of the school of sea painting of the last generation. The small room contains, in addition to Hunt's landscape before mentioned, several examples of

the work of David Cox (none of his best, however), Barrett, Varley, and others of our older water-colour artists; Barrett's "Through the Wood—Evening" (8) is a fine little picture in a more serious style than usual with him. Steelink's pastorals are good in themselves, but look too much like an imitation of Mauve, who, in fact, has had a great deal of this kind of compliment paid him by recent Dutch painters. The names of Messrs. Brett, A. C. Gow, Israels, and Mrs. Angell are also represented by small but interesting works, and the humorous element is supplied by one of Chevilliard's unkind but characteristic studies of the French priest, in this case joyfully carving a ham in consideration of "Carême Fini" (62).

Mr. McLean's Gallery.

The centre work at Mr. McLean's Gallery, the large picture by Israels, entitled "The Poor Man's Harvest" (27), is not one of the more interesting examples of this artist's work, though of course it has a value. The collection includes a very fine landscape, "On the Arun" (17), by Mr. Wimperis, whose grand skies and wide distances are as welcome in oil as in water-colour, and an original work by Mr. Fritz Thaulow, "Washington Place, New York" (40), with the brick houses a flaring red in the sunshine—we seem to have seen this picture before, or else a smaller study for it. M. Lhermitte's pastel sketches are among the best things in the room, especially the "Street Scene in St. Malo" (2); Westerbeck's sheep pictures are always good, but all very much alike; there are two pictures by Sir E. Alma-Tadema, one of which we have seen here (we think) before—neither of them represent his best work; and a powerful half-length, "The Burgomaster" (35), by Roybet. In the outer room are some works by older masters; among them is a quite typical example of Diaz (55), and a very small but powerful landscape sketch by Dupré (78).

Mrs. Stanhope Forbes's Exhibition.

"Children and Child-Lore" does not quite correctly describe the collection of drawings by Mrs. Stanhope Forbes at the Society of Fine Arts Gallery, as many of them represent neither subject; but we need not be critical about a matter of names, for it is a most interesting exhibition from an artistic point of view. The works exhibited are mostly rather slight studies in which an artistic thought is conveyed; most of them, in fact, needing no titles to explain themselves. Among the studies of single figures may be mentioned "Gladioli" (7), a half-length sketch of a woman holding a bunch of flowers, among which a single bit of red has a remarkable value in the colour effect; and "The Shell" (36), a slight sketch in coloured chalk of a woman holding an iridescent shell, and which is perfectly charming in design and colour. Among the drawings of children "An Artist at Work" (29), a boy at full length on the floor drawing on a sheet of paper, and "School" (34), have a great deal of character. Among the drawings into which more sentiment and subject enters are "The Boy and the Brownie" (37) a scene in a wood—the "Brownie" is just indicated in the background, but has his effect; and "The Changeling" (42), also a scene in a wood in which a woman of most "uncanny" expression is hurrying along with a baby—the "changeling;" the scene and the expression of the figure combine to produce a very weird effect. There are two or three very original landscape studies; among these "Across the Dunes" and "The Winding Road" (21 and 30) are examples of a poetic and suggestive work made from the simplest materials. Altogether this is an exhibition with quite a character of its own, and one which will perhaps be of even more interest to artists than to the general public.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

An ordinary fortnightly meeting of this Institute was held on Monday at No. 9, Conduit-street, Regent-street, W., Mr. J. M. Brydon, Vice-President, in the chair.

The minutes of last meeting having been taken as read,

Mr. Alex. Graham, Hon. Secretary, said it was with much regret he had to announce the deaths of the following members:—

Mr. F. W. Stevens, C.I.E., who was elected a Fellow in 1883. Mr. Stevens entered the Public Works Department of India as assistant in 1867, and in 1872 he was appointed executive engineer, Bombay. He had erected a large number of public and private buildings in India. He retired from the Civil Service in 1884, when he was appointed a Government member of the Bombay Municipal Corporation.

Mr. E. J. Lowther, elected an Associate in 1882 and a Fellow so recently as December last. He was a partner in the firm of Gordon, Lowther, & Gunton, and a member of the Court of Common Council.

Mr. C. E. Purday, elected an Associate in 1878. He was for many years associated with the late Ewan Christian, and subsequently, in conjunction with Mr. J. H. Christian, he carried out many works for the Ecclesiastical Commissioners. He was an old personal friend of his (Mr. Graham), and was a worthy gentleman and an exceedingly good architect.

Mr. W. J. Anderson, elected an Associate in 1893. In 1888 he was awarded the "Alexander Thomson Travelling Studentship," and published in 1890 a volume of architectural studies in Italy, containing drawings and sketches made during his tour. In 1896 he published "The Architecture of the Renaissance in Italy," and from time to time various articles by him appeared in the Institute *Journal*.

On the motion of Mr. Graham, it was agreed to send a letter of condolence to the nearest relatives of the deceased gentlemen. The Chairman remarked that Mr. Anderson's death was a distinct loss to the profession.

Working-Class Dwellings.

Papers on this subject were then read by Mr. W. J. Locke, secretary (for Mr. John Honeyman, R.S.A., who was unable to be present), Mr. Henry Spalding, Mr. W. E. Wallis, and Mr. Owen Fleming.

Mr. Honeyman, discussing the effect of injudicious legislation in the matter of building regulation, said that Local Authorities seemed to ignore the fact that the more their restrictions as regards number of stories, height of ceilings, width of passages, &c., increased the cost of the dwellings, the higher must the rent be. Dwellings of the early Peabody type, though the ceilings were low and the buildings high, were perfectly healthy, the death-rate being lower than the average. The building regulations of most of the large provincial cities made the erection of dwellings at moderate rents impossible. The better class of artisans are sufficiently catered for; the great and growing difficulty is the provision of wholesome houses for unskilled labourers and the poor, whose earnings were not more than 1*l.* a week; and not only the respectable poor, but the families of the dissolute, the intemperate, and even the criminal. As modern regulations made the erection of dwellings for the poorest class unremunerative to private enterprise, the municipality itself should undertake the work. But municipal corporations failed to recognise their responsibility. The author gave Glasgow as an instance. To meet the immediate needs of that city 2,000 dwellings were required, with an annual addition of 200 more to keep pace with the increase of population. The Corporation, however, had confined itself to the erection of a class of dwellings which could be provided without their assistance, with the result that in 1898 4,642 such houses—chiefly artisan's dwellings—were tenantless. Some relaxation of present building regulations must be permitted in order to provide houses which the poor can afford to pay for. They must be content with what is essential, and avoid what is merely desirable. Criticising a regulation prohibiting single-room dwellings, the author contended that for the very poor a house of one apartment for married couples, and small families of young children, was a perfectly suitable dwelling, both on economical and sanitary grounds. Compelling people to have more accommodation than they needed or were able to pay for only led to the overcrowding of houses by the introduction of lodgers. The lower in the social scale, the less a man could afford for rent in proportion to his income. Discussing remedies, the author said the alternative was forced upon the authorities either to relax building regulations or to supply the houses at unremunerative rates. The adoption of the latter alternative the author deprecated on economic grounds, and as increasing the burdens of the ratepayer. The difficulty, he considered, could be solved by either modifying building restrictions, or exempting such houses from their operation. The principle of exemption had been recognised by the promoters of the Glasgow Building Regulations Bill now before Parliament, which proposed to empower authorities to relax or modify any enactments or by-laws in the case of blocks of labourers' dwellings containing more than twenty-four separate dwelling-houses. Similar powers might safely be entrusted to the municipalities of large cities with private Acts; in other cases the sanction of a superior independent authority should be required. The laws against overcrowding can never be rigorously enforced until sensible provision is made for the housing of the poor. The fact that their dwellings must be near the place where their precarious living is earned constitutes sufficient difficulty, which should not be increased by injudicious legislation.

Associated Dwellings and Self-contained Tenements.

Mr. Henry Spalding, whose paper dealt with the associated dwelling and self-contained tenement systems, said that however successful block buildings may have been as schemes for housing the working classes, as *re*-housing schemes they had signally failed. Slums had been swept away, and the inhabitants had gone to overcrowd other places, while quite a different class of people had occupied the new buildings. The great difficulties they had to face were the ever-increasing cost of building, and of obtaining land suitable for the erection of dwellings at a reasonable price. In this class of work architects must practise the most rigid economy in planning and fittings. Little money could be spared for ornamentation, but by a judicious use of the materials at their disposal a good effect could always be obtained. Block dwellings, broadly speaking, were divisible into two classes: (1) Associated dwellings, in which the offices are common to two or more tenements, or if separate are placed in blocks away from the living-rooms, and approached from the staircase or corridors; (2) Self-contained tenements, in which all the offices are inside the front door. The associated dwellings can be made the most economical, and should be used for tenants of the poorest class. One objection to having common sculleries and water-closets is that a certain amount of supervision is necessary, and, when two or three of the tenants are responsible, cleanliness is often neglected. If separate offices are provided for each tenement, and these are all placed in one block, accessible from the corridors, a great deal of space is taken up for which there is no return in rent. Of the two systems, the author favoured the self-contained tenements, provided the class of tenants the buildings were intended for could afford the increased rent. The plan must depend upon the class of tenants to be housed. Tenements may consist of one, two, three, or even four rooms. The single-room tenements are on the associated plan. In dwellings for the poorest sculleries are not provided, and the sink is placed in the living-room. Where there

is a scullery, a copper should be placed in it and balcony space provided for drying purposes. If a copper is not provided, laundries may be conveniently placed in the courtyard or in the attic story. A convenient, but less economical, plan is to provide separate laundries to every five tenements. In the courtyards may be placed such buildings as workshops where the tenants may do small repairs, and a place where tools, barrows, &c., may be stored, and, especially in dwellings of the associated type, extra urinals and water-closets. In both the associated and the self-contained systems the tenements may be approached direct from the staircase or from a balcony running the entire length of the block, with two or three staircases, according to the number of tenements. The author described in detail the plan and arrangements of the Oldham-road block of labourers' dwellings, erected by the Manchester Corporation in 1893. The site occupies a superficial area of about 7,832 square yards, of which about 3,430 are covered by the buildings. The site is rectangular, and the buildings are ranged round its four sides, leaving in the centre a spacious recreation-ground. The block comprises sixteen shops and cellars, four laundries and drying-rooms, 237 two-room and forty-eight single-room tenements. The double tenements for families of four or five persons, the single for one person. Details were also given of the dwellings proposed to be erected by the London County Council on the Millbank Estate, Westminster. The author laid stress on the importance of securing cross-ventilation from front to back of houses as had been arranged in the Millbank Estate. Such tenements were far healthier than the houses usually occupied by artisans. An official report showed that during the five years 1894-98 the average death-rate in five blocks in Houndsditch was twelve per thousand, whilst for London during the same period it was eighteen per thousand.

Buildings Erected by the Peabody Trust.

Mr. W. E. Wallis, who followed, gave an account of the buildings erected by the Peabody Trust. The sum left by Mr. Peabody amounted to 500,000*l.*, his object being to provide good and wholesome dwellings for the poorer working classes, which could not only be let at considerably lower rents than those ordinarily charged, but would also return a fair percentage on the capital expended. That the original object was attained was shown by the fact that 1,300,000*l.* had been spent on land and building up to the end of last year. The average weekly earnings of the head of each family in residence was 1*l.* 3s. 1d. The average rent of each dwelling was 4s. 9¾d. a week, and of each room 2s. 2d. The rent included free use of water, laundries, sculleries, and bath-rooms. Having briefly described the earlier Peabody buildings, the author turned to those of more recent date. These were superior in every way to anything that had preceded them. The blocks are five stories high, except the centre portion, containing laundries and drying-rooms, which is six stories. There are ten rooms on each floor, with two sculleries and two water-closets in well-ventilated corridors outside the dwellings. Keeping sculleries and water-closets outside the dwellings the author considered far better than making the dwellings self-contained. The rooms are divided into dwellings of one, two, and three rooms, and are let at average rents of 3s., 5s. 6d., and 6s. 6d. respectively. The laundries are fitted up with four sets of coppers and washing tubs, with water laid on to all. The windows are louvred and the floors asphalted on concrete. Space is economised in corridors and passages, and ample light secured to all parts. The rooms are 8 ft. 6in. in height, the living rooms 13 ft. 6 in. by 11 ft. 9 in., bedrooms 13 ft. 6 in. by 9 ft. 9 in. The single living rooms are 14 ft. 6 in. by 12 ft. 6 in. The author enumerated the materials employed in construction, and gave a description of the fittings of the various rooms, staircases, sculleries, water-closets, methods of ventilation, drainage, &c. Dust-shafts were attached to each scullery. These the author considered were far preferable to sanitary pails, both on the score of health and convenience. Touching ventilation, Mr. Wallis disagreed with the view that buildings could not possibly be healthy unless the wind could blow completely through them—an idea that had even been extended to staircases and dwelling rooms—and that bedrooms should not be entered direct from the living rooms. In deference to this view, the London County Council architect had to provide in the Council's buildings back passages, although neither direct light nor air could be given to them.

Such passages were bad in the extreme, besides adding considerably to the cost. As to the bedrooms opening out of the living-rooms, where fires were daily kept going, there must always be a considerable change of air of all the rooms. In these dwellings the birth-rate for the year was 33·1 per 1,000, 3·6 above the average for all London; and the death-rate, including fifty-four tenants who died in hospital, 14·7 per 1,000, 4·0 per 1,000 below the average London rate. In this matter of averages, the author considered that the benefits derived from good sanitary dwellings could be better appreciated by striking the average not for the whole of London, but for the district in which the dwellings are situated.

Rebuilding of the Boundary-street Estate.

Mr. Owen Fleming, one of the Assistant-Architects to the London County Council, followed with a paper on "The Rebuilding of the Boundary-street Estate." He first dealt with the financial conditions under which the rebuilding scheme had to be carried through. The first section was designed upon the understanding that a hundred years' sinking fund would have to be provided for, the estimate calculated on this basis showing a surplus of 12s. per annum. After the working drawings, specification and quantities were completed, the sinking fund term was reduced to fifty-five years, with the result of converting the surplus into an annual deficit of 174*l.* 8s. 10d. This deficit had hampered the development of the estate. The first buildings were designed in a plain, simple style; though not architecturally suitable for the position, they were good, comfortable buildings, and were now very popular with the tenants. By the time the second section was completed the deficit had been cleared off, and surpluses were accumulating. Architecturally, this second section was more satisfactory. It contained also the cheapest buildings ever built by the Council. Cleeve Buildings cost 79*l.* per room, Sonning 68*l.*, Marlow 67*l.*, Shiplake 68*l.* An experiment tried in the S.E. angle of constructing only two self-contained tenements per landing was a failure financially, and the public did not take to the external treatment of the buildings. Before the final blocks were commenced, complaints began to be made about the smallness of the rooms in the blocks already erected. Private sculleries were also demanded, and a larger proportion of self-contained tenements. The result was a general improvement in the standard of accommodation, and the tenements afterwards put up were made more commodious and comfortable. The change, together with the rise in wages and price of materials, largely increased the cost per room. It was expected, however, that the rents would be sufficient to meet current expenses and the interest on the capital expenditure for land and buildings, and to provide a sinking fund to redeem the expenditure within from fifty to sixty years. The author considered the financial limitations needlessly severe. Better accommodation and buildings more worthy the care and labour bestowed on them would have resulted if the sinking fund term had been extended to 100 years. Mr. Fleming next described the plan of the estate, and gave full details of the various extra buildings and grounds for the convenience and recreation of the tenants. Of the 1,069 tenements, 541 consist of two rooms each, exclusive of scullery, 400 of three rooms each, 103 of four rooms each, fifteen single rooms, and ten special large tenements. Of the same buildings, 601 are entirely self-contained, 201 have the private water-closet detached, ninety have private water-closet and scullery outside the tenement, 142 have a private water-closet outside the tenement, but use a common scullery, while 35 use both scullery and water-closet in common with other tenements. The estate accommodates 5,380 persons. The cost of erection was about 91*l.* 10s. per room including all foundations. The cost of the land worked out at about 21*l* 16s. per room. In concluding, Mr. Fleming paid a warm tribute of admiration for the manner of the conduct of the work by Mr. Blashill, the Council's late Superintending Architect. He also referred to the architectural skill displayed by the younger architects, who had impressed very interesting individualities upon different portions of the estate. Many of them had studied together in the class-rooms of the London Architectural Association.

The Chairman, in opening the discussion, said they must all have listened with great interest to the papers, which were by men who must be considered experts on the subject. One or two general principles had struck him in listening to the papers. One was, of course, how to house the dispossessed tenants turned out of houses standing on a condemned area, for the general idea was that the dispossessed never came back to the improved dwellings. The second principle was how to build economically and efficiently, which was evidently the great crux of the question; and, thirdly, how to house the working classes near their work. As had been said, even to present the poorer classes of workmen with railway season-tickets would not be sufficient, for such classes must live within easy reach of their work.

Mr. Thomas Blashill, who was called on by the Chairman to propose a vote of thanks to the authors of the papers, said he was glad Mr. Owen Fleming had referred in such appropriate terms to the various gentlemen who had assisted in the Boundary-street scheme. A great work like that, especially while other similar work was going on elsewhere, required the assistance of other minds, and he was glad to be able to reciprocate the opinions expressed by Mr. Fleming. When one looked at the whole of the work carried out at Boundary-street, one could not but feel that a great deal had been done with very little material; bands of brickwork were about all that one could afford for ornamentation. Speaking generally, what was really wanted was a class of building that the poorer classes could live in; they should establish a minimum. He had fought the matter out with medical men, and had said that there were a great number of things which one would like to see provided in these buildings, but which one could not provide. It must not be forgotten that there was no class of society which had its houses perfect in every respect. Most people found something wanting, something to complain of in their dwellings; but in artisans' dwellings everything, it appeared, must be perfect. That was impressed on one everywhere, and everything one did for economy was abused by the philanthropist who inspected such buildings. But if buildings were to be cheap, economy must be practised in every possible way. He had been pressed by a gentleman to provide lifts to these buildings, on the ground that it was "too bad that some of the occupants should be compelled to climb a dwelling five stories high." It must not be forgotten that every piece of land the Council got for these buildings had to be excavated 17 ft. before a solid foundation could be obtained. He was of opinion that these buildings should not necessarily come up to the standard of the medical officers; if a public body did not build for the very poorest, whose requirements were not the same as those in a higher social scale, he did not know that they should build at all, for there were many private speculators who would and did build for the better class of artisan, and a lot of weekly property had been put up by the private speculator for these people. As to workmen living near their work, that was greatly too much insisted on. The original Artisans' Dwelling Act said that people dis-housed must be re-housed on the site or in its immediate vicinity, which was impossible, for the houses immediately adjoining the cleared area were as bad as those pulled down. The great bulk of the workers could go away two or three miles from their work very well, especially as they could ride long distances now for a penny. It was quite impossible to keep people as near their work as some people insisted they should be. The ground had been well covered by the papers read that evening, which were by men who had had experience in various ways as to dwellings of this class. He had been glad to hear the remarks made by Mr. Spalding and Mr. Wallis on the question of plans, and Mr. Honeyman's remarks struck him as being exceedingly just and fair. At Glasgow work of this kind was undertaken at an early date. Single-room dwellings in blocks were more usual in Scotland than in this country, and the bed-closets were not small cupboards such as were sometimes seen in cottages, but were quite roomy.

Mr. Douglass Mathews, in seconding the vote of thanks, said that Mr. Honeyman's paper dealt with the matter most fairly. He (the

speaker) could not understand what business public authorities had in erecting artisans' dwellings. Mr. Blashill had very rightly said that, in the ordinary way, dwellings were provided by private speculation for the working-classes, and he saw no reason why this plan should not be continued. He thought that assistance might be given by public authorities to enable private persons to build for the very poorest. If a substantial portion of the cost could be lent on a very low rate of interest something might be done for the very poorest workers, street hawkers, costers, dock labourers, &c., who were the people who should be housed near their work, and not the well-to-do artisan, who often did not require to get to his work until a comparatively late hour, and who left quite early. Such men could very well live some distance away from their work. The ordinary artisan's wages were almost double what they were some twenty-five years ago, and, seeing that clothing and food were cheaper, and that the conditions were altogether more favourable to such workers, there was no reason why special housing accommodation should be provided for them. The Boundary-street scheme was a case of beginning at the wrong end. To make the scheme pay the County Council had either to charge higher rents than the dispossessed poor could pay, or they had to spend the ratepayers' money to house such persons.

Mr. Woodward said that the reason, in his opinion, why public authorities could not provide artisans' dwellings at the low price some people desired was, that the workmen would not work. It was a well-known fact that the initiation of these buildings by the County Council had caused more organised idleness in London than the act of any other public body in England, and until the workman endeavoured to give a reasonable day's work for a reasonable day's pay no public or private body could provide accommodation at the price the very poor could afford. He agreed with Mr. Honeyman's ideas as to public authorities giving some latitude in the erection of these buildings, and he went so far as to say that if corridors and staircases were made fireproof, it was not necessary that the whole building should be. It was in consequence of a few fires in the City, which had caused great destruction to property, that there were these expensive enactments forced upon building owners, and he thought that those enactments might very well be relaxed to some extent. He thought, too, that the walls of some of these dwellings were thicker than necessary. The big ground landlords were to blame for the very hard terms which they enforced upon any one who attempted to build on their land.

Mr. Henry Lovegrove said the planning of the Boundary-street buildings was admirable and the elevations were extremely pleasing. But were the concrete partitions quite secure? He almost thought that they would not prove to be if a tenant, who might be intoxicated, fell against them. He could not lose sight of the fact, that hundreds of the people turned away from Boundary-street by the clearance of the area were crowding in the immediate vicinity—a family in nearly every room. In a block of buildings he knew of the overcrowding had been such that one scullery was occupied by a women and three children, and another by a woman and four children. An important matter was as to the tenants of these model buildings. A private individual built a block of model dwellings and within two years of their completion the medical officer asked him (the speaker) to go into the police-court to testify as to the filthy condition of the buildings. While thought was being given to the house troubles of poor people, could nothing be done to make them more cleanly and decent? As had been said, the Boundary-street buildings did not meet the real want. What had been done was to provide nice homes, at low rents, for railway men, builders' foremen, and such men—superior tenants—while the poor people who lived from hand to mouth, the sellers of toys in the streets, for instance, had to crowd together in low and miserable dwellings.

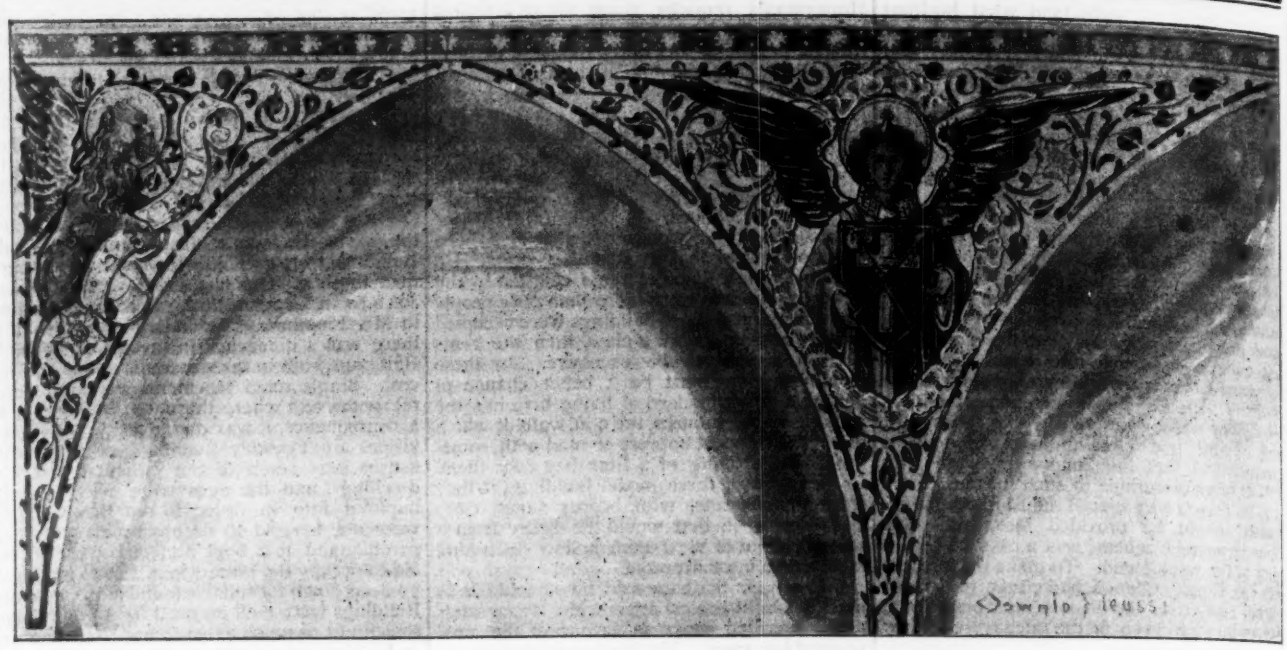
Mr. E. W. Hudson said he thought that architects and surveyors were a little to blame for the large amounts ground landlords claimed for their property. In giving evidence before an arbitrator or in the Courts, estimates of value by the opposite sides did not exactly tally, and there was a tendency on the part of an owner's valuer to take rather too rosy a view as to the value of the land. As to Mr. Honeyman's remarks about single-roomed tenements, the necessity of such tenements had never before so clearly appealed to him. As to private speculation, it must be remembered that upon an ordinary 16-ft. block, at a ground-rent of 6*l*., they could not get more than four dwellings. The 6*l*. ground-rent, capitalised at five years' purchase, ought to give 30*l*. to 34*l*. a year in rentals. In some quarters of London a difficulty was that tenants utilised all wooden fittings for firewood, and he wondered what had been done to prevent that at Boundary-street. He had always felt that the rents charged by the Peabody Trustees were more than poor people could pay, but if those buildings were occupied by the artisan working-class, then the rents did not appear to be excessive. In these dwellings there must be a better chance of getting a good standard of living than in some cottages in the suburbs, the 9-in. walls of which were built almost entirely of mud with, sometimes, the shaking of a lime bag over them. As to floors of these model buildings, if they were of concrete, with boards nailed close down on to it, that would be better from a sanitary point of view than hollow floors and it would be more fireproof.

Mr. H. H. Statham said he should like to make a slight protest against Mr. Honeyman's rather decided move in favour of the one-roomed tenement. Mr. Honeyman had shown that there were classes of tenants for whom this kind of dwelling seemed desirable; but when such a dwelling was proposed for a family the question of decency and morality had to be considered. If parents with very young children were admitted to these dwellings they would probably live on there; he thought it was therefore undesirable to encourage the use of these dwellings for married people. For a single man or for two women living together the one-roomed tenement answered very well. The question of the self-contained or associated building was also concerned with questions of sanitary conditions and decency. It was far better for a man who would keep his house decent to have it self-contained, and to have all his sanitary arrangements within his own house; but in legislating for the lowest class of people they could not forget that closets were not likely to be kept in decent order, and unless they were placed outside they were not open to proper supervision, except by domiciliary visits, which were an intrusion on privacy and should always be avoided if possible. As to the Manchester plan exhibited that evening, he deprecated the adoption of the quadrangular plan for a building of this character. The arrangement of the open staircases was a very old theory of his; but when it was a question of housing a great number of people in one block of buildings the quadrangle was the least desirable form; at all events, one side of it should be one story and not carried up the whole height. As to this class of buildings paying or not, he should like a little more information as to the Peabody buildings as to whether they were remunerative. A good many years ago he was inquiring into the subject, and had an interview with the then manager of the Peabody Trust, who was contemptuous about the philanthropists who wanted to make a percentage. He said: "We do not want profits; we are doing good to the lower classes." Looking at the low rents at which some of the rooms were let, compared with those at Boundary-street, it was a question whether it was not to some extent pauperising the people—at all events, the rents seemed to be lower than would appear to be remunerative. The health statistics of these dwellings were very satisfactory, because some years ago medical men appeared to think that these enormous blocks of dwellings were unwholesome. The statistics, if correct, might be taken as an answer to that view.

The Chairman then put the vote of thanks to the meeting, and it was heartily agreed to.

Mr. Wallis said he had a few remarks to make in reply. As to the class of people housed in these dwellings, if good dwellings were provided at a cheap rent it was difficult to say that they must secure a poor class of tenants while the better class was not properly housed. The Peabody Trust did their best to secure a poor class of tenants by restricting the amount of wages the head of the family occupying rooms could earn. If a man was earning more than 25s. a week he was not accepted. Of course, a man might very well earn more than that sum and yet mention that as the amount; but the trustees, where a man had regular employment, ascertained from the employer the amount of a man's wages. The Peabody Buildings were occupied by such people as charwomen, labourers, lightermen — the class that Mr. Peabody wished to house. As to the rents in Peabody Buildings, in comparison with the rents of such buildings as the Boundary-street ones, it was no use talking about the cost of a room unless one ascertained the size of the room. The rooms of Peabody Buildings were decidedly larger, on an average, than those at Boundary-street. The cost was 86*l*. a room, as against 91*l*. per room, according to Mr. Fleming, at Boundary-street; so that there was a difference in favour of Peabody Buildings, both in the size of the rooms and the cost. Single room tenements were most useful rooms, and where there was immorality as a consequence, it was due to a want of supervision. In Peabody Buildings, every year a census was taken of the inhabitants of the dwellings, and the ages were very carefully inquired into in order to see that children were not too old to occupy rooms with their parents, and that boys and girls were not too old to occupy the same room. As to having to go deep down for suitable foundations, Peabody Buildings were built on good hard ground, and sometimes as much as 24 ft. had to be dug out as at Westminster, where, it was true, part of the excavation paid for itself, because they came across some very fine sand. On that site they excavated on an average 16 ft., so that the County Council had not had greater difficulties in that direction than others. The average rent of the Peabody Buildings was 2s. 2d. per room, and the County Council Buildings were 3s. per room. It was true that the County Council had to refund the money spent in erection within a certain number of years, but the Peabody Trustees made on new buildings a profit of about 3¼ per cent., in some cases a little more. That was not the case with their old buildings, on some of which large sums had been recently spent in sanitary work, though by and bye, of course, things would be different even with those buildings; but on modern buildings, with all expenses thrown in, the Peabody Trustees could make a profit of 3¼ to 3½ per cent. Over the whole Trust it worked out at about 3 per cent., taking old and new buildings. That proved that this class of building could be built to pay. The great expense in planning was the dodging about necessary and the great amount of passage-way. In all buildings he had erected he had tried to avoid passage-ways. When one had to provide back passages, and had to twist a building about in order to get all sorts of things which were not wanted, somebody had to pay, and the earnings were reduced. Tenants, for instance, did not want through draught, nor did any one who occupied rooms. In inclement weather rooms were blown right through, and it appeared to be thought that the working classes were a lot of noxious animals. Tenants of these buildings were in the habit, it must be remembered in planning, of putting the largest pieces of furniture into their rooms that they could get, so that with a narrow room there was no space to pass round the bedstead, or chest of drawers. Architects aimed at getting wholesome dwellings, but comfort should not be forgotten. In some plans he recently saw, for a building society, one of the dwelling-rooms had four doors, a fireplace, a window, and two cupboards; as the room was only about 13 ft. by 10 ft., it was difficult to imagine any comfort in that room for the occupants. The fewer the doors in such dwellings the more comfortable, provided a certain amount of light and air was obtained. Before very much could be done to help the working classes in this matter of housing, the Home Office must be taken to book. Only last November a railway company wanted to transfer to the Peabody Trust their liability to rehouse 168 persons displaced by them, but the Home Office refused their consent, although the Trust had agreed to provide for 300, because the Trust did not, in their opinion, provide for a sufficiently high class!

Mr. Owen Fleming, in the course of a brief reply, said that the people who lent the money for the County Council dwellings were the stockholders, and the Council, or ratepayers, were simply the guarantors. Their reward for the onus of acting as guarantors was the unencumbered freehold of the whole estate at the end of sixty years, and, in his opinion, that was a rather good financial transaction. He



Mural Decoration for All Saints' Church, South Acton. By Mr. Oswald Fleuss.

ventured to submit that Mr. Wallis had not quite grasped the point of Mr. Statham's criticism. It was not the question whether the Council or the Peabody Trustees had spent the money well or not (and they must not forget that the Peabody Buildings were erected between 1864 and 1880, when the cost of building was very much less), but if the rents of the Peabody Buildings were raised, could the rooms be let? [Mr. Wallis: Yes.] Exactly! That was Mr. Statham's point. The Peabody Trustees were in the difficulty that they were earning a rate of interest that was incompatible with the present market value of money; while on the other hand they were under-letting their buildings. The partitions of the Boundary-street buildings were of coke breeze and portland cement, 2½ in. to 3 in. thick, and they were quite sound.

The Chairman announced that the next meeting will be held on the 9th inst., when the adjourned discussion will be resumed on the subject of "Ancient Lights."

The meeting then terminated.

MURAL DECORATION FOR ALL SAINTS' CHURCH, SOUTH ACTON.

THIS suggested mural decoration for All Saints' Church, South Acton, represents a series of angels with outstretched wings, each angel holding a shield on which are the emblems of the Passion, surrounded by conventional floral decoration. The emblems of the four Evangelists occupy each corner of the north and south sides of the chancel walls.

The drawing, by Mr. Oswald Fleuss, was exhibited at the Royal Academy last year.

THE HOUSING OF THE WORKING CLASSES OF LONDON IN THE FUTURE.

A SESSIONAL meeting of the Sanitary Institute was held on Wednesday at Margaret-street, W., when Mr. Thomas Blashill, F.R.I.B.A., read a paper on "Housing the Working Classes."

In the course of the paper, the author observed that the clearing of all our "Unhealthy Areas" would not put London into the condition of a healthy habitable town. It would leave untouched all the evils of insanitary and overcrowded dwellings not forming statutory areas; and so the problem of housing in the future began with the recognition of those evils and their abatement. The disturbing conditions as regards the housing of the "working classes" were many: the encroachment of business premises and buildings of a public character on the ground formerly occupied by dwellings; unwillingness of the people to leave a familiar neighbourhood; necessity to be near the place where work may be found; inability to increase earnings in proportion t the increase of rent. Lastly, he might mention an obstacle more serious than most others, in the increased demands of sanitary science as to house accommodation. These, however justifiable, bore for the time with excessive severity on those who must try to find house room on moderate terms.

Yet in spite of all this, and more, there was a very large section of the working classes for whom the housing problem was being solved in the old-fashioned way. This process had not received the notice that it deserved. In those suburbs where cheap trains and cheap trams were having most influence, farms were being covered with houses, not by pairs or by half-dozens, but by roadsful and by hundreds. They were not jerry-built, the plans were excellent, there were good front gardens for flowers, and back gardens for vegetables or tennis. For those who did not require a whole house there were builders who provided a house for two families, or three. And the immense extent to which small families were accommodated as lodgers, without any approach to overcrowding, must not be forgotten. This was private enterprise, under the system of supply and demand.

The provision of houses in blocks was a more risky matter, and the return was lower. There had for some time been an indisposition to go on with this work so necessary in and near to central districts, not so much on account of the scarcity of sites as because of the increased cost of building and the increase in the necessary outgoings. Lastly, he would mention the more recent development of the common lodging-house into a kind of hotel or residential club.

In the discussions on the subject they heard a liberal amount of abuse aimed at the ground landlord, or at his class, or at the system which fostered the class. It was a system peculiar to England, and almost limited to London. Perhaps the most plausible case against landowners was that they were holding up land that ought to be built upon some years sooner than actually happened. So far as he knew the owners of suburban land were only anxious for a chance of getting it off their hands by sale or, preferably, by lease. But land was very much like fruit, which did not become marketable till it was ripe. But when the most had been made of the burden of ground rent, it was not very excessive when compared with the cost of building. The rise in prices during the last few years has added quite as much to the cost of dwellings as the amount of the ground rent, and this was at present the most serious obstacle to their erection.

It had been proposed to fix "judicial rents" in respect of all properties, by what means or on what basis he did not know. If its object were to put a stop to all negotiation and to all building except by the municipality, one could imagine that it would succeed. Building in future by the municipality of all houses for the working classes was very often advocated. No one had estimated the millions that would require to be raised for this purpose, nor the amount of loss which would result. Recently it has been suggested that, as there must be a loss on houses for the working class, the municipality, or perhaps the State, should undertake the building of all houses, so as to balance this loss by the profit made on the houses of the rich. According to his experience, building was an occupation about as risky as anything short of gambling pure and simple, and of all branches of municipal trading it had so far proved the least suitable.

The classes that required to be in some way "housed" were below those for whose accommodation private enterprise was now catering in the ways he had described, and above, though not very much above, the condition of paupers. They could make a poor living if allowed to overcrowd dilapidated and insanitary dwellings, but the increase in their numbers and the pressing demands of the commercial class had for long been making their position more difficult. The municipal conscience was stricken at the aspect of their surroundings, but it ought not to relieve itself at the expense of the sufferers, whose case, bad as it is, could easily be made worse. In measures strictly temporary to get over an emergency they must not be too particular about economy, vulgar or political.

In respect of unhealthy areas, he had suggested that for the future the Municipal Authority should not spend money in buying property, but should, at about one-fourth the cost, rehouse the very individuals displaced. In the case of overcrowded houses this rehousing was not optional, but had now become a matter of necessity. They could not turn all these thousands into the streets. Powers must be obtained much clearer and stronger than those at present possessed by the Municipal Authority. Overcrowding should be defined by Act of Parliament, and not left to local judgment or the ideas of a magistrate.

It would be necessary in most cases to rehouse at greater cost than the families were able to afford. Very often a family would have to live in two or three rooms, when it had hitherto lived in one. The municipality must provide that extra cost, including compensation for long distance travel, by paying it in the shape of weekly rent direct to the owners of the newly occupied tenements. This payment would only be made for a fixed number of years, to give the family time to adapt itself to the new arrangements. If a family should refuse such an offer, it could make its own arrangements, but it could not be allowed to go into a house already overcrowded. No doubt a very large number of new buildings would be required for rehousing—block dwellings near the centre, and cottages in the suburbs. In the present emergency it mattered little how these should be provided. The municipal authority might build, but i

should not discourage other persons or companies. On the contrary, it might buy land to be let out on reduced terms for building working-class dwellings, or the parish rates on dwellings so built might be temporarily reduced. The cost of all this rehousing would be large, but it must be remembered that they were dealing with an evil which many people felt to be beyond expression in words. They had been spending fifty pounds per head in removing the population of unhealthy areas without rehousing; he estimated that it would not have cost one-fourth of this amount to rehouse them, if they refrained from buying up the slum property.

Repairs and cleansing were two other matters besides overcrowding, for which the municipality urgently required larger powers.

There should be power to put an end to the interest of any lessee who had shown a determination to avoid his responsibility, so that the superior landlord might be reached and charged with this duty. And, as to cleansing, they might imitate the practice in Berlin. There, if the staircase of a tenement house was kept dirty, the fire brigade was sent to cleanse it, and the landlord had to pay the cost. If the tenement was kept dirty, it had to be vacated while being cleansed by a similar process.

He believed that the working man who longed to acquire his own house was a rarity; but, if block dwellings or groups of cottages could be made remunerative, small savings might be invested in companies formed for building or acquiring them, and it might be that habits of carefulness in the use of a house would be developed.

LETTER FROM PARIS.

THE disastrous fire which on the 8th ult. destroyed the historical building of the Maison de Molière or Théâtre Français, was a catastrophy greatly to be deplored, not only on account of the destruction of a large portion of the building, but also by reason of the irreparable loss of a large proportion of the artistic riches it contained.

The Théâtre Français, as a building, dates from 1786, as the marble slab still to be seen on the smoke-blackened façade testifies: "The Theatre was constructed during the years 1786 to 1790 by the Architect Louis; it was restored and enlarged by Prosper Chabrol during 1860-1864. Its name was changed several times, being first, in 1790, 'Théâtre des Variétés Amusantes,' 'Théâtre de la rue Richelieu' in 1791, 'Théâtre de la Republique' in 1792, and 'Comédie Française' from 1799."

Victor Louis, the architect of the theatre in 1786, was the first to employ a system of iron construction as a means of lessening the risks of fire. In 1822 Fontaine received orders from Louis-Philippe, Duc d'Orleans, to restore and enlarge the theatre, which had been greatly damaged during the Revolution, and from 1822 to 1825 the interior of the theatre and the stage were completely rebuilt and redecorated, and the Nemours façade added. Chabrol in 1860 built the portion now facing the Place du Théâtre Français.

The stage measured 72 ft. across by 57 ft. deep and 85 ft. high. The ceiling of the "Salle," originally decorated and painted by Barrias, having become almost destroyed by smoke and gas fumes, was redecorated by Mazerolles in 1879, and for this work the artist was promoted to the grade of "Officier" of the Legion of Honour. This ceiling has, unfortunately, been irreparably destroyed.

The Maison de Molière, ever an interesting store-house of works of art relating to comedy and drama, had in recent years, through gifts and purchases, become a veritable museum of artistic richness of the highest value. The large vestibule on the Rue de Richelieu, of oval form and decorated with an imposing Doric order, contained four valuable marble statues, the "Talma" by David d'Angers, "Tragedy" and "Comedy" by Duret, and "Tragedy" by Clesinger, as well as a large number of marble busts by well-known sculptors. The grand staircase, built by Chabrol, was of fine architectural effect, it was decorated by an Ionic order, and archivolts and ceiling covered with bas-reliefs, winged cariatides, groups of children, and vases of flowers, and the fine wrought-iron balustrade sculptured by Carrier-Belleuse and others. In the vestibule were the well known statues of Mars and Rachel, the first by Thomas, the second by Duret. On the landings of the grand staircase were eleven busts of dramatic authors, the work of David d'Angers, Dantan, and Chapu. The foyer or gallery on the Rue de Richelieu contained a number of busts, some of them due to Caffieri and Clesinger. The inventory mentions sixty-three works of painting, some of which are signed by eminent names—Delacroix, Carle Van Loo, Gérard, Largillière, Ingres, and others.

It is interesting to note that the Académie de Peinture held its first exhibitions of painting on the site now occupied by the theatre. The marble slab placed on the façade at the angle of the Rues Richelieu and Montpensier, by the Commission des Monuments Historiques, reads: "The Académie Royale de Peinture et de Sculpture, founded in 1661, occupied from 1661 to 1692 the ground on which this theatre now stands, and there held its exhibitions in 1667, 1669, 1671, and 1673."

Fortunately, most of the important and movable works of art were saved from destruction in time, but a very large proportion of the smaller objects, manuscripts, and artistic bric-à-brac were destroyed. The chief objects have been removed and carefully stored for the present in the Louvre buildings.

The causes of the disaster are not precisely known, and probably never will be; but the report of M. Bunel, the Architect of the Prefecture de Police, states that the fire was not caused either by gas or electricity, but without doubt by the heating apparatus, which was in a deplorably bad state of working order. The pipes from the heating apparatus were filled with an immense quantity of soot, which in an incandescent state was violently thrown out by the heating vents into the theatre and set fire to the inflammable objects nearest to the vents. This explains the reason of the rapid progress of the fire at so many parts of the building at once.

The whole of the theatre is now in the hands of carpenters and masons who are actively doing the work necessary for supporting the dome and walls, the portions of the interior which are hopelessly ruined are being cleared away, and Mr. Guadet, the Architect of the Théatre Français, promises to have the building completely restored on the lines of its original plan and decoration in time for the fête of July 14 next.

The Préfet de Police has addressed the following circular to all the Police Commissioners at Paris:—"The two fires which have lately taken place at the Trianon Theatre and the Comedie Française, demonstrate that, despite the numerous and important improvements made in the arrangements of theatres during the past few years, the slightest commencement of fire in such essentially inflammable centres is liable to bring about a catastrophe. You are ordered to resume the permanent fire service in the theatres, and I request you to make a thorough and most rigorous supervision. The rules and regulations must be observed with the utmost rigour." The official report made by the engineers of the Fire Brigade Service states:—"With regard to the fire at the Comédie Française we have noted: the efficiency of the iron doors in each case where they were kept closed; the slight resistance of the stone staircases—the four stone staircases of the theatre gave way under the effects of the fire; the resistance of wood embedded in plaster—the top portion of the stage and the dome of the theatre resisted the fire, the floor of this dome was untouched and the roof has not been damaged."

The subject for the Competition Godebeuf at the Ecole des Beaux-Arts this year was a decorative wood ceiling. The programme specified a decorative ceiling for a large hall, composed of framed, moulded, and sculptured wood, adorned with gilding and painted panels. The prize was awarded to M. Lebret for a clever design and drawing, the first medal was awarded to M. Huillard. The prize for the Prix Leclere competition at the Ecole was carried off by M. Joseph Bernard, a pupil of M. Pascal. The subject was a pavilion representing France at a foreign exhibition.

The Jury for Architecture at the Salon of 1900 is composed of the following members:—MM. Pascal, Vaudremer, Daumet, Scellier de Gisors, Moyaux, Mayeux, Laloux, Guadet, Redon, Raulin, Loviot, Deglane, Chancel, and Normand.

The following rules have been made with regard to the right of taking photographs of the various buildings in the Exhibition grounds. Hand cameras will be allowed during the hours at which the Exhibition remains open to the public, and no fee is payable for the right of using them. A permission must be obtained for the right of using tripod cameras; photographs with these must be made in the morning, and the fee per camera for one morning will be 25 francs; the fee for permission during the whole period of the Exhibition will be 1,000 francs per camera.

The sixty-seventh annual congress of the Société Française d'Archéologie will be held at Chartres towards the end of June, presided over by M. A. de Marsy, Director of the Society. The programme of the discussions and excursions will be made known shortly.

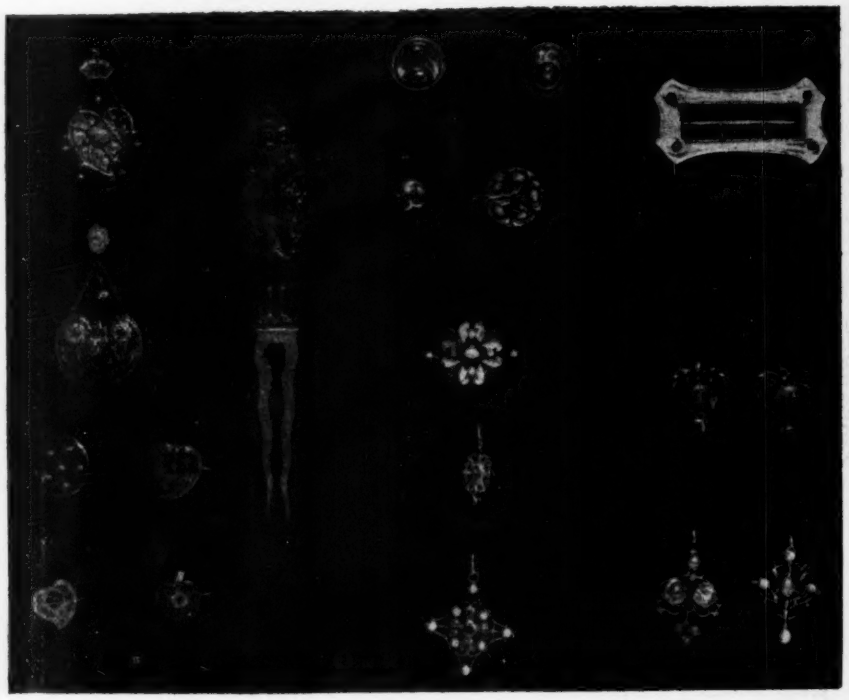
The interesting Pavillon de Hanovre, a charming specimen of eighteenth century architecture still remaining on the Boulevard des Italiens, will shortly be demolished if the "Commission du Vieux Paris" does not arrange for the purchase of the building. It was built, after the drawings of Chevetot, on the borders of the old ramparts now absorbed by the boulevards. The well-known oval salon on the ground floor was decorated by Boucher, who also painted the ceiling, now effaced; the beautifully sculptured panels of the walls are still to be seen. As it is unlikely that the "Commission du Vieux Paris" will be able to afford the purchase of the building and the ground on which it stands, it will probably shortly be replaced by one of the ordinary *maisons à loyer*, but in any case it has been decided to take all possible photographs of the building as it stands, and to negotiate the purchase of the decorative woodwork and fragments of architecture, and store them in he Musée Carnavalet.

The President of the Republic has accepted the invitation made in person by MM. Jean Paul Laurens, Bartholdi, Boisseau, Lemaire, Maignan, Pascal, and Tony Robert-Fleury, President and members of the Société des Artiste Français, to visit the annual Salon, which will be opened on April 7 in the temporary building raised on the Place de Breteuil.

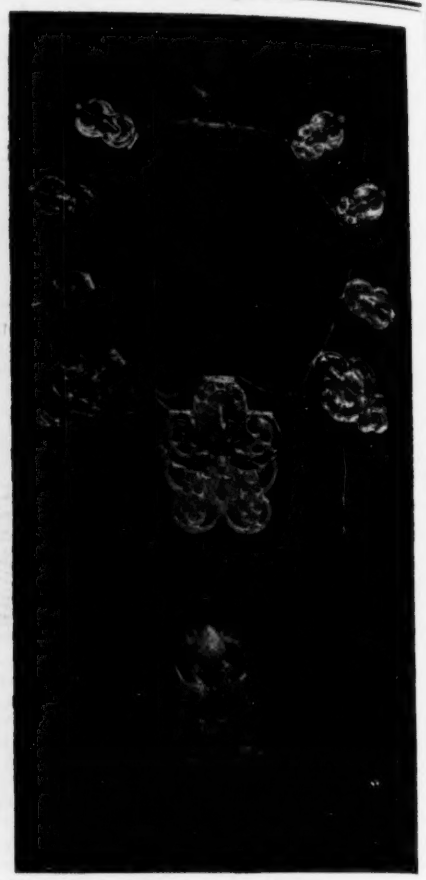
The official inauguration of the Great Exhibition will take place on April 14, despite the absolute unreadiness of the larger portion of the Exhibition. The President of the Republic, followed by an escort and accompanied by the Ministers, will be received in the Grand Salle des Fêtes now being erected in the old Machine Gallery, by the Minister of Commerce, who will officially hand over the Exhibition to the President. After a fitting reply M. Loubet will declare the Exhibition opened to the public. The official cortege will then visit the various portions of the buildings and grounds, and will inaugurate the new Alexandre III. bridge. Taking the Exhibition in its present state, less than a fortnight before the inauguration, it seems scarcely possible that the public will be permitted to visit a large portion of the buildings in their very unfinished condition.

No doubt a quantity of work will be done during the few remaining days, and the Salle des Fêtes, where the inauguration will take place, will be somewhat more advanced than at present, although it seems hopeless at this moment with the immense quantity of lofty scaffolding and the far from finished state of the plaster and painting decoration. The machinery sections are a perfect wilderness of excavation earth, cases, and goods not yet in position, filling the passages and gangways. In other sections requiring only the putting down of floors and the fixing up of show cases, the state is more hopeful, but still the surrounding building work and its accompanying dirt and dust makes the exhibitors refrain from putting into position the objects to be exhibited. The Château d'Eau is not yet ready, and several of the central pavilions are still far from completion. The Exhibition taken generally appears to be in a far more backward state when so near to the opening day than previous Exhibitions, but the undertaking this time is by far more important. In about a month to six weeks from now the difference will be great. Still at present a visit to the grounds and buildings is very interesting, for many reasons. After the opening day no work will be allowed in any portion of the buildings during the day-time; all uncompleted work will have to be continued between midnight and six in the morning. It is not easy to see how the work can be rapidly completed if no other working hours than the above are allowed.

M. Baudin, Minister of Public Works, is carefully entering into the serious question of the employment of the mass of workmen of all trades whom the completion of the Exhibition



Jewellery by Various Artists.



Enamelled Necklace and Pendant, by Mr. W. S. Hadaway.

will put out of work. A very large proportion of these workmen come from the provinces, and many of them will be disinclined to return to their own towns to search for work at a much lower wage than that they have for some time been accustomed to. In order to facilitate the finding of work for these men, and to persuade them to return to the provinces by means of sure opportunities of work, the Minister of Public Works has prepared lists of the various public works shortly to be commenced in the provinces; these lists are being fixed up at the entrances of the Exhibition. Special facilities will be afforded workmen as regards their journey to the towns in question, and offers interesting at least 12,000 workmen are being made.

The temporary building for this year's Salon, in the Place de Breteuil, from the design of M. Thoumy, has been successfully completed in two months. The gardens for sculpture are on the right of the building; there are thirty-two galleries for painting, among which are two large saloons of twenty mètres square. All precautions have been taken to prevent accidents, especially against fire. This temporary building has cost 660,000 francs, in addition to which the Municipality of Paris is charging the Société 60,000 francs ground-rent for the site. The number of works admitted has been considerably reduced, and the exhibition this year only includes 1,400 pictures, 373 works in sculpture, and 140 architectural designs; while last year the total number of works exhibited was 4,908.

The new Salon, though it has organised no exhibition this year, will not be excluded from the usual liberality of the Government in regard to the purchase of works of art, for the Inspecteurs des Beaux-Arts are to visit the studios of the principal artists who have generally exhibited at the New Salon for the purpose of selecting works for purchase.

Fifty-six architects have competed for the proposed municipal fire-brigade barracks at Ménilmontant. The designs have been scheduled in the Salle des Fêtes of the Hôtel de Ville, and the jury have awarded the first premium to M. Doillet, the second to MM. Dezermaux & Mallet, the third to M. Bérard, and the fourth to MM. Maistrasse & Berger.

The disaffected members of the Société Internationale des Beaux-Arts have formed themselves into a new society of painters and sculptors under the presidency of M. Gabriel Mourey; their first exhibition has been opened in the Georges Petit gallery. There are nine foreigners among the exhibitors, among whom are Mr. Frank Brangwyn and Mr. Fritz Thaulow. Among the French adherents the prominent names are those of MM. Cottet, Latouche, and Henri Martin; M. Charpentier, the sculptor, has also joined them. Special notice has been excited by two small pictures by Mr. Brangwyn, "Les Potiers au bord de l'eau" and "Scène d'Orient." Among the best works by the French artists are M. Cottet's "Cabaret," M. Ménard's "L'Estuaire," M. Latouche's "Matin" and "L'Adieu," and M. Aman-Jean's "Danseuse." The Venetian studies by Mr. Thaulow are also to be noticed.

M. Valadon, the painter, has died, at the age of seventy-four. He was an able painter of *genre* pictures and portraits, and received medals in the Salons of 1880 and 1886. We have also to record the death, at the age of fifty-nine, of M. Léon Perrey, the sculptor. He was a pupil of his father and of Jouffroy, and was awarded medals in the Salons of 1866 and 1867. He was the author of the figure representing the "Génie de la Chasse" in the pediment of the new portion of the Louvre, and of the "Génie Civil" at the Trocadéro.

DESIGNS FOR JEWELLERY, &c.

THE examples of jewellery and ornaments shown here are from the collection at Mr. Montague Fordham's new establishment in Maddox-street, which has before been referred to in our columns.

The miscellaneous collection "by various artists" consists of a hair-comb and six pieces of enamel by Mr. J. Cromer Watt; four buttons, three brooches, and a clasp, by the Birmingham Guild of Handicraft; and four pendants, by Mr. and Mrs. Gaskin.

The other illustration shows a necklace and a pendant in enamelled jewellery, by Mr. W. S. Hadaway.

GLASGOW INTERNATIONAL EXHIBITION, 1901.—We are asked to state that all applications for space at the Glasgow International Exhibition, which is to be opened in May, 1901, must be lodged not later than the 1st of June of this year with the General Manager, Mr. H. A. Hedley. The classes of exhibits include (among others) mining, industrial design and manufactures, machinery and labour-saving appliances in motion, locomotion and transport, lighting and heating. Separate sections will be devoted to archæology and fine art.

THE BUILDING TRADES' GIFT TO THE NATION:

PERMANENT HOMES FOR DISCHARGED SOLDIERS.

THE Executive of the Building Trades' Gift to the Nation have much pleasure in announcing that there was a material increase in the list of contributions in kind during the past month, whilst over 1,300*l.* was brought together in money, including no less than 400*l.* in the form of sixpences and shillings generously collected by the workmen. A considerable amount of material is, however, still required, particularly in respect to timber, joinery, and facing bricks, whilst 5,000*l.* is still required in money.

In order to assist in bringing together this 5,000*l.*, Mr. J. Randall, as President to the Builders' Institute, when completing his term of office last week, offered 50*l.*, if forty-nine similar amounts are subscribed, either as individual sums, or in the form of a combination of smaller items, as for instance, two mutual subscriptions of 25*l.*, or five of 10*l.* Mr. H. H. Bartlett (Perry & Co.) kindly opened this special list by promising two donations of 50*l.*, whilst Mr. Howard J. Colls and Messrs. Holland & Hannen have each given 50*l.* towards this special object.

Mr. Edwin O. Sachs (as Chairman) further announces that among the gifts in kind during the current week was a large iron church, 50 ft. long, presented by Messrs. Dixon & Co., of London and Liverpool.

Mr. T. F. Rider (as Hon. Secretary) further announces the following monetary subscriptions:—

	£	s.	d.
Mr. H. H. Bartlett (Perry & Co.)	100	0	0
Mr. Howard J. Colls	50	0	0
The Worshipful Company of Joiners (per Mr. T. F. Rider)	21	0	0
Messrs. Dennett & Ingle	21	0	0
Mr. W. Hayward (Brixton) (late Hayward Bros., Southwark)	10	10	0
Workmen of Messrs. Lindsay, Neal, & Co.	9	15	0
Workmen of Messrs. Gillow & Co.	8	17	0
Workmen of Messrs. George Trollope & Sons (Decoration, Upholstery, and Cabinet Department)	5	13	3
	5	5	0
Mr. L. Summerfeld	5	5	0
Messrs. G. & J. Earle, Limited (Hull)	5	5	0
Mr. E. J. Saunders (Croydon)	5	0	0
Workmen of Mr. George Jennings	5	0	0
Mr. James Annan	3	4	11
Workmen of Messrs. J. B. Johnson & Co., Liverpool	3	3	0
Messrs. G. Gude & Son, Hackney	3	0	9
Workmen of Mr. Chas. W. Matthews			

	£		
Messrs. G. & A. Smith and workmen.....	2	2	0
Mr. Robert Fox	2	2	0
Mr. R. Bamforth and workmen, Leeds...	1	11	6
Mr. James Sossick, Chelsea	1	1	0
Mr. W. Canty and workmen, Stoke Newington	1	1	0
Mr. J. R. Jackson and workmen	1	1	0
Messrs. H. Bates & Son	1	1	0
A Friend of Mr. Rider	1	1	0
Workmen of Messrs. Sissons, Bros., & Co., Limited.....	0	15	6
Workmen of Mr. J. Bullock, Barnet	0	10	0
Workmen of Messrs. W. J. Whalley, Blackburn.....	0	4	0

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday in the County Hall, Spring Gardens, Alderman W. H. Dickinson, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the St. Pancras Vestry 7,600*l.* for a refuse destructor; the Wandsworth District Board, 10,600*l.* for paving works; the St. George's Guardians, 20,000*l.* for the extension of the infirmary; the Plumstead Vestry, 1,600*l.* for sewer works; and the Shoreditch Guardians, 1,575*l.* for electric lighting works at the workhouse.

Works Department—Frauds by Workmen.—The report of the Finance Committee contained the following paragraph :—

"We submit to the Council a summary of the facts in connexion with certain frauds which have been committed by workmen in the employ of the Works Department. In July last the works accountant discovered that irregularities were occurring in the time-keeping at Hedsor and Laleham buildings, Boundary-street. The practice of the Council is to pay wages to the workmen every Saturday for work done up to five o'clock on the preceding Friday night, the wages sheets being prepared by the timekeeper and countersigned by the general foreman. It sometimes happens, however, that a workman cannot attend for his wages at pay time owing to sickness or other causes, and if such a workman sends a proper authorisation for his wages to be paid to a representative, payment is so made. It should be mentioned that the payment of wages takes place in the presence of the foreman and the timekeeper. The first irregularity which was noticed was a request signed in the name of Jones in respect of wages alleged to be due to a man of that name. Upon inquiry it appeared that Jones had presumably worked for a week, for the first time, on the job, but had not been able to attend for his money; but the pay-clerk, finding the request not quite in order, declined to pay the wages, and handed the request back to the man who presented it. On making inquiries during the next week it was ascertained that, although Jones was then supposed to be at work, he could not be found at Hedsor-buildings. Further investigation showed that the number of these requests for wages to be paid to a nominee had largely increased at this job. Five such requests in different weeks had been made payable to and received by a bricklayer named Goulding, but on careful examination it was proved that they were forged, one request having been presumably signed by a man named Beale, who is the only person named in the requests who can be traced, and who can neither read nor write. This man gave evidence to the effect that he had not worked the week in question. Proceedings were taken against Hutchins, the timekeeper, and Goulding, and they were convicted and sentenced to nine months' and six months' imprisonment respectively in the second division, the judge remarking that they had been guilty of a very clever and ingenious fraud. Sufficient evidence also was produced to warrant the prosecution of a bricklayer named Brown and a carpenter named Horsman (the latter being the man who had presented the request for payment of Jones' wages). Brown was discharged for want of evidence and Horsman was committed to the Central Criminal Court, and subsequently sentenced to two months' imprisonment in the second division. The manager informs us that he believes the general foreman on the job to have been absolutely straightforward and honest, but that he trusted too much to the timekeeper's honesty, and did not therefore discover the fraud. He has been dismissed. The system of fraud practised is that known in the building trade as 'dead men,' and is exceedingly difficult to detect when there is a conspiracy between the timekeeper and several men to defraud in this manner. It is impossible to ascertain the amount of which the Council has been defrauded, but it probably exceeds 100*l.* We have, however, now given instructions for arrangements which we trust will effectually prevent a recurrence of the irregularities mentioned above. We have deemed it inadvisable to report these facts at an earlier date, as the prosecutions of the offenders were not concluded until March 15."

Mr. C. H. Campbell said that one of the reasons he had always objected to the Council undertaking its work was that they had no check over their employés. They had between 2,600 and 2,700 men working for them in the Works Department, and who could say that the system which had been exposed was not more largely carried out?

Mr. H. Williams pointed out that amongst large builders a system prevailed of sending clerks round to interview each man on the wage-sheet before any money was paid, and this prevented any such fraud as that which had been practised by the Council's workmen.

Mr. Bruce, Chairman of the Finance Committee, said the system under which the frauds took place originated under the Works Committee, and until it proved a failure the Finance Committee did not consider it wise to interfere with it. They were now endeavouring to prevent anything of the kind by having travelling inspectors to go round.

Quantity Surveyors.—The General Purposes Committee reported as follows, the recommendation being agreed to :—

"The Council on February 13 last revised the standing orders relating to the taking out of quantities for architectural works, and ordered that the agreements with the quantity surveyors employed for those works should be terminated, and the list of surveyors revised and enlarged. Notice has accordingly been given to the present four surveyors to terminate their agreements with the Council, and we are now in a position to submit the names of seven firms with a view to their appointment by the Council. We recommend that the Council do employ upon the conditions laid down in the resolutions of the Council on February 13, 1900, the following firms of quantity surveyors for architectural works, viz. :—

Mr. C. W. Brooks, Moorgate-station-buildings, 63, Finsbury-pavement, E.C.
Messrs. Franklin & Andrews, 25, Ludgate-hill, E.C.
Mr. J. R. Hunt, Bridge House, 181, Queen Victoria-street, E.C.
Messrs. J. Leaning & Sons, 28, John-street, Bedford-row, W.C.
Messrs. C. John Mann & Son, 28, Great George-street, S.W.
Messrs. Northcroft, Son, & Neighbour, 8, St. Martin's-place, Charing Cross, W.C.
Mr. W. H. Strudwick, 14, Parliament-street, S.W.

and that the solicitor be instructed to prepare the necessary agreements."

No. 17, Fleet-street.—The question of the preservation of the old premises, No. 17, Fleet-street, referred to in our last issue, was next considered, and a long discussion ensued. The General Purposes Committee recommended :—

"That the estimate submitted by the Finance Committee be approved, that the Council do sanction the expenditure of a sum not exceeding 27,300*l.* for the acquisition of the freehold of the premises, No. 17, Fleet-street, and for the restoration of the same in the manner indicated in this report, that the solicitor be instructed to complete the matter, and that the seal of the Council be affixed to the necessary documents when ready."

After several divisions and the defeat of various amendments, the committee's recommendation was agreed to, with the addition of the following words :—"Subject to the contribution of 2,500*l.* by the Corporation of London, and the payment by that body of a proportion of the cost of widening the roadway."

Places for Cremation.—The Parliamentary Committee recommended, and it was agreed, that the Burial Authorities (Cremation) Bill as circulated be approved, and that steps be taken for introducing it into Parliament during the present session.

Housing of the Working Classes.—The Housing of the Working Classes Committee recommended, and it was agreed :—

"That the Housing of the Working Classes Committee and the Parliamentary Committee be authorised to appoint a joint deputation to wait upon the President of the Local Government Board with a view to urging upon him the desirableness of the amendments referred to in the report being introduced by the Government in their bill now before Parliament for the amendment of Part III. of the Housing of the Working Classes Act, 1890; and that the deputation be authorised to take such other steps as may be necessary or desirable."

Theatres, &c.—The following applications under the Metropolis Management and Building Acts Amendment Act, 1878, were, on the recommendation of the Theatres and Music Halls Committee, agreed to :—

Alterations of the vestibule, London Hippodrome, Cranbourne-street (Mr. F. Matcham).

Arrangements at the Sussex Arms, Culford-street, Hackney (Mr. W. Scott).

Alterations to the Tivoli Music Hall (Mr. W. Emden).

The Council, having transacted other business, adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

AT the meeting of the London County Council on Tuesday, the following applications under the London Building Act were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated :—

Lines of Frontage.

Hampstead.—A theatre building on the south side of Pond-street, Hampstead, at the corner of Fleet-road (Mr. F. Matcham for Mr. W. Jones).—Consent.

Fulham.—A school-keeper's house at the Peterborough schools, on the north-west side of Clancarty-road, Wandsworth Bridge-road, Fulham (Mr. T. J. Bailey for the School Board for London).—Consent.

Hammersmith.—That the application of Mr. G. Trotman for an extension of the periods within which the erection of an addition to No. 180, King-street West Hammersmith, was required to be commenced and completed, be granted.—Agreed.

Islington, North.—A one-story shop on part of the forecourt of No. 127, Stroud-green-road, Islington (Mr. F. E. Grayson for Mr. D. F. Keer).—Consent.

Islington, North.—One-story shops on part of the forecourts of Nos. 131 and 133, Stroud-green-road, Islington (Mr. F. L. Pither for Dr. Brighouse).—Consent.

Rotherhithe.—That the application of Mr. A. C. Forrester for the Building Committee of the Bermondsey Presbyterian Church for an extension of the periods within which the erection of a church, with a one-story porch in front, on the west side of Southwark Park-road, Bermondsey, was required to be commenced and completed, be granted.—Agreed.

Wandsworth.—One-story shops on part of the forecourts of Nos. 147 and 149, Balham High-road, Balham (Mr. W. C. Jones for Mr. A. C. Rhodes, Mr. J. J. Sainsbury, and Mr. G. B. Wilkins).—Consent.

Islington, South.†—A one-story addition, with an iron and glass shelter in front, on part of the forecourts of Nos. 399, 401, and 403, City-road, Islington, at the corner of Torrens-street (Mr. T. C. Jenkins for the City and South London Railway Company).—Consent.

Fulham.—An hotel and three houses with shops on the west side of Holyport-road, Fulham, at the corner of Crabtree-lane (Mr. T. Woodbridge Biggs for Mr. H. J. Greenham).—Refused.

Projections.

Bermondsey.†—That permission be given to Mr. W. J. Huxley to retain an illuminated sign at the "Prince Consort" public-house, No. 210A, New Kent-road, extending beyond the general line of buildings in Searles-road, on condition that he do remove such sign at the expiration of one year.—Agreed.

Hampstead.—Wooden canopies or hoods over the entrances to two houses known as Glengariff and Killarney on the north side of West Hampstead-avenue, Hampstead (Mr. W. A. Burr for Mr. J. Tomblin).—Consent.

Kensington, South.—An iron and glass covered way at the entrance to No. 3, Bolton-gardens West, Old Brompton-road, Kensington (Messrs. H. Smith & Son for Mr. H. Homewood Crawford).—Consent.

Lewisham.†—That permission be given to Mr. Bender to retain an iron and glass illuminated sign at "The Talma" public-house, Wells-road, Sydenham, extending beyond the general line of buildings in Coombe-road (Mr. A. L. Guy for Mr. Bender).—Agreed.

Lewisham.—Bay windows in front of Nos. 111 to 117 and 123 to 129 (odd numbers only), Minard-road, Catford (Mr. J. Lawrence for Mr. A. Cameron Corbett, M.P.).—Consent.

St. George, Hanover-square.—That permission be given to Mr. G. Odone to retain a projecting iron and glass shelter at the entrance to No. 152, Victoria-street, St. George, Hanover-square, extending beyond the general line of buildings in the street (Mr. R. Willey for Mr. G. Odone).—Agreed.

Strand.—An iron and glass shelter at the entrance to the Florence Hotel, Nos. 56, 57, and 58, Rupert-street, Coventry-street, St. James's (Messrs. Chambers and Dewes for Mr. L. Azario).—Consent.

Strand.—That permission be given to Mr. J. E. Cheevers to retain an iron and glass sign at the "Savoy Palace" public-house, extending beyond the general line of buildings in Savoy-street, Strand (Mr. T. Beet for Mr. J. E. Cheevers).—Agreed.

City of London.—Oriel windows on the second and third floor levels of premises on the north side of St. Paul's-churchyard, City, at the corner of Cheapside (Messrs. Gordon, Lowther, & Gunton for Messrs. D. Nicholson & Co., Limited).—Consent.

Westminster.†—An iron and glass shelter at the

entrance to the Belgravia Hotel, Nos. 72 and 74, Victoria-street, Westminster (Mr. G. A. Hall for the Belgravia Hotels Company, Limited).—Refused.

Hammersmith.—An iron and glass illuminated sign at the entrance in Bridge-road to the "Hop Poles" Tavern, King-street, West Hammersmith (Mr. J. W. Brooker for Mr. J. Fleming).—Refused.

Width of Way.

City of London.—Stables on the west side of Duke-street and the east side of George and Catherine Wheel-alley, Bishopsgate-street Within (Mr. F. W. Foster).—Consent.

Westminster.—Rebuilding of No. 29, Great Chapel-street, Westminster, at less than the prescribed distance from the centre of Dacre-street (Mr. P. H. Nowell for Mr. A. Craddock).—Consent.

Whitechapel.—Rebuilding of Nos. 9 and 10, White's-row, Spitalfields (Mr. E. Gregg for Mr. J. S. Daniels).—Consent.

Whitechapel.—Rebuilding of a factory on the north-west side of Half Moon-passage, Whitechapel High-street (Messrs. Wigg, Oliver, and Hudson for Messrs. B. Morris & Sons, Limited).—Consent.

Rotherhithe.†—A warehouse on the south side of Tooley-street, Rotherhithe, upon the sites of Nos. 136 to 148, Tooley-street, at less than the prescribed distance from the centre of Magdalen-street (Messrs. F. Chambers & Son for Mr. F. J. Chambers).—Refused.

Space at Rear.

Dulwich.—A modification of the provisions of Section 41 (1) (vi.) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a three-story building, to be inhabited by persons of the working class, on the south side of Bassano-street, Lordship-lane, East Dulwich, with an irregular space at the rear (Mr. E. Crosse, for the Right Rev. Abbott Snow).—Consent.

Woolwich.—A modification of the provisions of Section 41 (1) (vi.) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a two-story dwelling house, with a one-story shop, on the east side of Roydene-road, Plumstead, with an irregular space at the rear (Mr. R. A. Jack for Mr. J. B. Atkins).—Refused.

Deviation from Certified Plans.

Fulham.—Deviations from the plans certified by the District Surveyor under Section 43 of the Act, so far as relates to the proposed rebuilding of the "Jolly Maltster" beer-house on the site of No. 15, Vanston-place, and Nos. 1, 3, and 5, Farm-lane, Walham Green (Messrs. Nowell, Parr & Kates for the Royal Brewery Company, Brentford).—Consent.

Line of Frontage and Width of Way.

Wandsworth.†—Retention of a one-story building, used as a laundry, on the south side of Putney Bridge-road (Mr. H. R. Jones for the Cathkin Laundry, London, Limited).—Consent.

Lines of Frontage and Space at Rear.

Chelsea.—An addition at the rear of No. 45, Cadogan-gardens, Chelsea, to abut upon Culford-gardens (Mr. R. G. Hammond for Sir Francis Astley Corbett, Bart.).—Consent.

Paddington, South.—A porch to No. 12, Burwood-place, Paddington, and the raising of the back additions at the rear of No. 12, Burwood-place, and No. 125, Edgware-road (Mr. J. Dell, for the Public Benefit Boot Company, Limited).—Consent.

Width of Way and Construction of Sheds.

Southwark, West.†—An addition to the Lant-street School at less than the prescribed distance from the centre of Toulmin-street, Southwark, and the erection and construction of two play-sheds at less than the prescribed distance from the centres of Rodney-street and Toulmin-street respectively (Mr. T. J. Bailey for the School Board for London.—Consent.

Lines of Frontage, Width of Way, and Space at Rear.

St. George-in-the-East.—A building upon the site of Nos. 210 and 212, Commercial-road East, and No. 1, Jane-street, St. George-in-the-East, to the line (Mr. H. Moon for the directors of the Capital and Counties' Banking Company, Limited).—Consent.

Projection and Construction of Building.

Strand.—A projecting angle turret at No. 6, Great Marlborough-street, St. James's, at the corner of Poland-street, and the construction of a cantilever to support a part of the rear portion of that house (Mr. R. S. Wornum for Mr. W. F. Williams).—Refused.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. C. Dunch sanctioning the formation or laying out of a new street for carriage traffic to lead from Streatham-high-road to Streatham-common South, and the widening of portions of Streatham-high-road and Streatham-common South in connexion therewith (for Mr. M. H. Voss). That the name Voss-court be approved for the new street.—Agreed.

Hackney, South†.—That an order be issued to Messrs. Hodson & Whitehead refusing to sanction the formation or laying out for carriage traffic of a new street to lead from Morning-lane to Chatham-place, Hackney (for Mr. H. W. Rowlandson).—Agreed.

Conversion of Building.

Bermondsey.—The conversion of a building, used as a warehouse and offices, on the east side of Riley-street, Bermondsey, at the corner of Tidal-place, into a dwelling-house in connexion with a medical training mission (Mr. E. Crosse for the Church Missionary Society).—Consent.

Recommendations marked † are contrary to the views of the Local Authorities.

Books.

Le Costruzioni in Calcestruzzo ed in Cemento Armato. PER L' ING. GIUSEPPE VACCHELLI. Milano: Ulrico Hoepli. 1900.

THE "Manuali Hoepli" of the well-known Milanese publishing firm, Ulrico Hoepli, may be compared with "Weale's Series," published in England, only that they cover a still wider field. The little manual before us is of exceptional merit, and may be described as a useful book for students and engineers desiring special knowledge of the composition of concretes and cements, and the uses of these latter for constructional purposes. The English student reading Italian must be cautioned, however, as to that part of the work dealing with concretes, as so much of the material used in Italy does not occur in this country, and certain well-known varieties of cement dealt with, especially those wholly or in part derived from volcanic debris, are peculiar to the peninsula.

This is not a book, therefore, in which we find many generalities of use to the English student, unless he is to be employed on constructional works in Italy, when the observations of Sig. Vacchelli become invaluable. It must not be understood, however, that the manual treats only of Italian materials and results; on the contrary, it deals also with certain English, American, German, and Austrian materials. The results obtained at official testing laboratories on the Continent seem selected for especial treatment, which is no doubt a more correct method than by giving a mass of miscellaneous data obtained under varying conditions.

The first chapter deals with the history and general nature of hydraulic limes and cements. The table on page 3 is worth a great deal. It gives the relative proportions of clay and calcium carbonate to make nine of the best known limes and cements (including pozzolana), the index of hydraulicity of each kind, and time each takes to set. The second chapter deals with certain properties of hydraulic limes and cements, including their general chemical composition and physical characteristics, such as weight, resistance, and permeability. In speaking of pozzolana, the author remarks that it is very largely used in Italy as a medium hydraulic cement. It is worked at Bacoli (in the Bay of Pozzuoli, near Naples), and at S. Paolo, near Rome. It varies greatly in colour, ranging from greenish, yellowish, and brownish to blackish, this last mentioned usually appertaining to an inferior variety of more earthy character. The density of this cement varies from 0·95 to 1·04. Good pozzolana from Bacoli should possess, approximately, the following chemical composition:—

Chemical Composition of Pozzolana.

Silica	56·20
Alumina	19·00
Sesquioxide of iron	8·70
Magnesia	0·25
Soda	2·90
Potash	3·95
Calcium carbonate	2·90
Water	3·90
Traces of calcium sulphate, and loss	2·40

From the above it will be noticed how very widely pozzolana differs from ordinary limes and cements. The calcium carbonate, instead of being a predominating factor, sinks to less than 3·0 per cent., whilst its place is largely taken by silicate of alumina, alkalis, and iron. It is a remarkable cement, and in addition to the Italian localities cited, Signor Vacchelli states that it occurs in the island of Santorin (Greece), the Azores, the Ardennes, and at Cantal in France.

The third chapter treats of official regulations as to the qualities of cements used on public works, &c. The regulations are set forth in some detail, and serve to remind the English reader that many restrictions are placed on the composition of cement in certain European countries. These rules should prove useful to British manufacturers of Portland cement, &c., who are exporters. The regulations specially mentioned are those emanating from the office of the Ministry of Commerce, Industry and Public Works of Prussia (1887); the rules drawn up by the authorities of the city of Turin (1894); and the elaborate specifications relating to Portland cement drawn up by the French Administration of Bridges and Roads (1896).

Chapter IV. describes the nature of the stony constituents used in connexion with the limes and cements already mentioned. Sand is treated in much detail, the dimensions of the grains being regarded as the prime factor in the classification of the different kinds of sand, after due consideration has been paid to the three chief kinds as determined petrologically, viz., argillaceous, calcareous, and siliceous sand. Grit and other similar constituents are also discussed. The English reader will be more particularly interested in the author's observations on the uses of lapilli, volcanic sand (called Vesuvian sand, though we know not why), and pumice. He might have given more attention to the first and last-mentioned of these volcanic products, especially in reference to the manufacture of light cement bricks—as made near Andernach (Rhine), and other localities on the Continent.

The next two chapters enter into the question of the proportions of different kinds of cement to be allowed with different grades of sand, grit, &c., to get the best results, and the method of mixing by hand and by machinery. The seventh chapter describes concrete, its antiquity and some other elementary points. Then follow particulars as to its crushing weight, impermeability, compactness, specific weight, and lateral extension, in which we see nothing of a novel character. The remainder of the book is occupied by a lengthy description of modes of construction in concrete and in cement of various types of building and engineering works, such as walls, floors, arches, bridges, tubes, conduits, roofs, &c., those of concrete first, and in ordinary cement towards the end.

We have nothing but praise for this manual, except that, in common with others in the same series, the type is too small, and the index might have been extended and drawn up in better order. A whole section under the letter P (p. 309) has gone astray.

Bruges: A Historical Sketch. By WILFRED C. ROBINSON. Bruges: Louis de Plancke. 1899.

THIS book is almost entirely occupied with a political history of Bruges; but the twelfth chapter, on "Merchants and Guilds," is of interest to those who are looking at Bruges from the architectural side, as it gives some information in regard to circumstances which influenced some of the architectural characteristics of the city, the effect of which is still to be traced. In the fifteenth century all the civilised nations of the world had their representative houses in Bruges, and the names of "Paris Halle" and "Spaniards'-street" still bear evidence of this. The author enumerates forty-seven guilds of crafts as existing in the fourteenth century, the most influential being the Carpenters and the Masons. In regard to the latter, he observes, "Many of the quaint bits of stone-carving, inserted in old houses about the city, were proofs of capacity produced by those who sought admission to this guild." The book is worth reading by any one who is about to visit Bruges, as assisting in an understanding of the relations of the older buildings to its past history.

The prosperity of Bruges always hung more or less on the rather shifting and uncertain conditions, in that flat country intersected by canals or canal-like rivers, of direct communication with the sea. In the fourteenth century this communication appears to have been so far intercepted or unsatisfactory that the principal merchandise had to come round by the Scheldt through the rival city of Ghent, where of course it encountered heavy tolls. It was the attempt of the Bruges people to turn the course of the River Lis, in the fourteenth century, in order to get a better water communication, which aroused the strife between Bruges and Ghent commemorated by

Henry Taylor in the first part of "Philip Van Artevelde":—

"The devil,
Who never sleeps, awakened them of Bruges
To dig about the Lis to turn the water."

History repeats itself in so far that the modern city of Bruges is now promoting the making of a new and wide canal to the sea, with the view of restoring her ancient prosperity. Fortunately in the present day such a scheme does not lead to an appeal to arms on the part of those who may be jealous of it.

Hydraulic Power Engineering. By G. CROYDON MARKS, A.M.Inst.C.E., M.I.Mech.E. London: Crosby Lockwood & Son. 1900.

ALTHOUGH containing a great deal of useful information, this book may be defined as an incomplete and insufficiently covered skeleton of the extensive subject named in the title. It is true that the author recognises the impossibility of dealing in any single volume "adequately or comprehensively with the many problems arising in the different sections into which the very large subject of hydraulics and hydraulic engineering naturally divides itself." But the necessity for such an attempt is not altogether obvious. Many well-known writers have found no difficulty in filling entire volumes when dealing with the theoretical principles upon which hydraulic power engineering is based, and several writers have devoted separate volumes to the consideration of different types of hydraulic machinery. After a careful perusal of the book by Mr. Croydon Marks, we are of opinion that criticism would have been somewhat disarmed if, instead of calling his work "A Practical Manual on the Concentration and Transmission of Power by Hydraulic Machinery," it had been entitled an introduction to the study of some hydraulic machines. The book is divided into eight parts or sections, of which the first is devoted to a brief resumé of the general principles appertaining to hydrostatics and hydraulics. The second part, not quite happily entitled "preliminary," comprises some concise and well-expressed comments upon hydraulic pressures, materials, and test-loads. Joints and valves are relegated to two separate sections; accumulators are discussed rather too briefly in a section supposed to be confined to the consideration of lifting machines; and pumps for the establishment of pressure occupy one section themselves. It would be much more convenient and appropriate if all these details were discussed in a section allotted to auxiliary appliances generally. So far as the chapter on platform lifts extends, the subject is well treated, but detailed references to large passenger lifts for deep-level railways, and to the powerful railway-wagon lifts employed in goods stations might have been made with advantage. The next chapter entitled "Workshop and Foundry Cranes," contains a brief account of three or four cranes, but curiously enough most of the space is occupied by descriptions of other appliances, such as the hydraulic jack, Duckham's weighing machine, and portable lifting or pulling tools. Hydraulic traversers of various kinds are entirely omitted. Warehouse and dock cranes are dismissed in about three pages of letter-press, and then comes the chapter on accumulators, which would be considerably improved if the illustrations were dimensioned or drawn to some known scale, and if serviceable data were included in the descriptive matter. Presses and metal-working appliances suffer equally from want of space, and the book finishes with a section on hydraulic motors, the last chapter of which is not devoted to motors at all, but to five or six "Recent Achievements." These might very well have formed part of the different chapters to which they properly belong, where, of course, precise scientific treatment could have been accorded.

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THIS book is so well known to the architect and plumber that a detailed review of the new edition is quite unnecessary. All that we need do is to draw attention to the new matter which has now been added, and the modifications which the author's views have received in recent years. A chapter "On Cesspools and Their Overflows" has been inserted, and this includes a short description (with illustrations) of the septic-tank system of sewage-purification as applied by the author to the sewage of a country mansion. The chapter, however, is too short to be of much service. Some information as to the capacity of the sewage-tanks and of the areas of the filters for different volumes of sewage would have been useful, and Mr. Scott-Moncrieff's latest method of purification certainly merited notice, as did also Dr. Poore's filtration-gutters. We are surprised to find Mr. Hellyer permitting soakage-cesspools to be used, even where there are "no deep wells within a safe distance, say a mile or so." If a man constructed such a cesspool on a large estate (without any wells), "a mile or so" from the boundary in every direction, there might be no great objection to his action, but it is certainly objectionable that a man should construct a soakage-cesspool on a small property and so prevent his neighbour from sinking a well and obtaining a pure supply of water.

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We may add that the book has been revised throughout, and has been enriched with many new illustrations. Mr. Hellyer must be congratulated on having added so much to the value of his extremely valuable work.

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A Digest of the Law of Easements. By L. C. INNES. Sixth edition. London: Stevens & Sons, Limited. 1900.

WE are glad to welcome another edition of this excellent work. It is only (including the index) 130 pages in length, but it may fairly be said to contain in codified form the law relating to easements. It may be well to give an example. We take it from that part which is concerned with the right to support. "A right of easement may be acquired by grant or prescription to the support of *buildings* by the adjacent or subjacent soil. There is no natural right to such support." This is the way in which law books should be written on clear and well-ascertained branches of the law. Then they are as useful to laymen as well as to lawyers. There is only one point as to which we desire to make a protest. The price of this little book is 7s. 6d. It ought to be 3s. 6d. Not one lawyer or layman in a hundred will buy the book at its present exorbitant price. When a book is largely and necessarily costly to produce, and is intended only for lawyers, it is reasonable to publish it at a high price. But this reason does not apply to a small book intended for laymen as well as lawyers.

The Management of Dynamos. By G. W. LUMMIS-PATERSON. London: Crosby Lockwood & Son. 1900.

THE second edition of this useful work has been revised and slightly enlarged. The main addition is a chapter on the construction and management of motors. Since we last reviewed this book in these columns we have had occasion to recommend it more that once to electricians and others who have little experience of dynamo working. To these its principal use is something to fall back on in case anything goes wrong, but it also contains many useful hints which, if attended to, will greatly lengthen the life of the machine and prevent breakdowns.

The "Practical Engineer" Electrical Pocket-Book for Manchester. The Technical Publishing Company. 1900.

THIS is an excellent pocket-book for electricians, and it is published at a very moderate price. Unlike other books of its class, there is very little antiquated matter in it. The brief descriptions of apparatus and the short *résumé* of theory are very well done. For a first edition the tables and formulæ are remarkably free from errors. It would be better, however, if the limitations of the theory given were mentioned. The reader would naturally think that the power expended in an alternating current circuit was simply the ohmic loss (C^2R). The theory of alternating

entrance to the Belgravia Hotel, Nos. 72 and 74, Victoria-street, Westminster (Mr. G. A. Hall for the Belgravia Hotels Company, Limited).—Refused.

Hammersmith.—An iron and glass illuminated sign at the entrance in Bridge-road to the "Hop Poles" Tavern, King-street, West Hammersmith (Mr. J. W. Brooker for Mr. J. Fleming).—Refused.

Width of Way.

City of London.—Stables on the west side of Duke-street and the east side of George and Catherine Wheel-alley, Bishopsgate-street Within (Mr. F. W. Foster).—Consent.

Westminster.—Rebuilding of No. 29, Great Chapel-street, Westminster, at less than the prescribed distance from the centre of Dacre-street (Mr. P. H. Nowell for Mr. A. Craddock).—Consent.

Whitechapel.—Rebuilding of Nos. 9 and 10, White's-row, Spitalfields (Mr. E. Gregg for Mr. J. S. Daniels).—Consent.

Whitechapel.—Rebuilding of a factory on the north-west side of Half Moon-passage, Whitechapel High-street (Messrs. Wigg, Oliver, and Hudson for Messrs. B. Morris & Sons, Limited).—Consent.

Rotherhithe.†—A warehouse on the south side of Tooley-street, Rotherhithe, upon the sites of Nos. 136 to 148, Tooley-street, at less than the prescribed distance from the centre of Magdalen-street (Messrs. F. Chambers & Son for Mr. F. J. Chambers).—Refused.

Space at Rear.

Dulwich.—A modification of the provisions of Section 41 (1) (vi.) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a three-story building, to be inhabited by persons of the working class, on the south side of Bassano-street, Lordship-lane, East Dulwich, with an irregular space at the rear (Mr. E. Crosse, for the Right Rev. Abbott Snow).—Consent.

Woolwich.—A modification of the provisions of Section 41 (1) (vi.) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a two-story dwelling house, with a one-story shop, on the east side of Roydene-road, Plumstead, with an irregular space at the rear (Mr. R. A. Jack for Mr. J. B. Atkins).—Refused.

Deviation from Certified Plans.

Fulham.—Deviations from the plans certified by the District Surveyor under Section 43 of the Act, so far as relates to the proposed rebuilding of the "Jolly Maltster" beer-house on the site of No. 15, Vanston-place, and Nos. 1, 3, and 5, Farm-lane, Walham Green (Messrs. Nowell, Parr & Kates for the Royal Brewery Company, Brentford).—Consent.

Line of Frontage and Width of Way.

Wandsworth.† —Retention of a one-story building, used as a laundry, on the south side of Putney Bridge-road (Mr. H. R. Jones for the Cathkin Laundry, London, Limited).—Consent.

Lines of Frontage and Space at Rear.

Chelsea.—An addition at the rear of No. 45, Cadogan-gardens, Chelsea, to abut upon Culford-gardens (Mr. R. G. Hammond for Sir Francis Astley Corbett, Bart.).—Consent.

Paddington, South.—A porch to No. 12, Burwood-place, Paddington, and the raising of the back additions at the rear of No. 12, Burwood-place, and No. 125, Edgware-road (Mr. J. Dell, for the Public Benefit Boot Company, Limited).—Consent.

Width of Way and Construction of Sheds.

Southwark, West.†—An addition to the Lant-street School at less than the prescribed distance from the centre of Toulmin-street, Southwark, and the erection and construction of two play-sheds at less than the prescribed distance from the centres of Rodney-street and Toulmin-street respectively (Mr. T. J. Bailey for the School Board for London.—Consent.

Lines of Frontage, Width of Way, and Space at Rear.

St. George-in-the-East.—A building upon the site of Nos. 210 and 212, Commercial-road East, and No. 1, Jane-street, St. George-in-the-East, to the line (Mr. H. Moon for the directors of the Capital and Counties' Banking Company, Limited).—Consent.

Projection and Construction of Building.

Strand.—A projecting angle turret at No. 6, Great Marlborough-street, St. James's, at the corner of Poland-street, and the construction of a cantilever to support a part of the rear portion of that house (Mr. R. S. Wornum for Mr. W. F. Williams).—Refused.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. C. Dunch sanctioning the formation or laying out of a new street for carriage traffic to lead from Streatham-high-road to Streatham-common South, and the widening of portions of Streatham-high-road and Streatham-common South in connexion therewith (for Mr. M. H. Voss). That the name Voss-court be approved for the new street.—Agreed.

Hackney, South†.—That an order be issued to Messrs. Hodson & Whitehead refusing to sanction the formation or laying out for carriage traffic of a new street to lead from Morning-lane to Chatham-place, Hackney (for Mr. H. W. Rowlandson).—Agreed.

Conversion of Building.

Bermondsey.—The conversion of a building, used as a warehouse and offices, on the east side of Riley-street, Bermondsey, at the corner of Tidal-place, into a dwelling-house in connexion with a medical training mission (Mr. E. Crosse for the Church Missionary Society).—Consent.

Recommendations marked † are contrary to the views of the Local Authorities.

Books.

Le Costruzioni in Calcestruzzo ed in Cemento Armato. PER L' ING. GIUSEPPE VACCHELLI. Milano: Ulrico Hoepli. 1900.

THE "Manuali Hoepli" of the well-known Milanese publishing firm, Ulrico Hoepli, may be compared with "Weale's Series," published in England, only that they cover a still wider field. The little manual before us is of exceptional merit, and may be described as a useful book for students and engineers desiring special knowledge of the composition of concretes and cements, and the uses of these latter for constructional purposes. The English student reading Italian must be cautioned, however, as to that part of the work dealing with concretes, as so much of the material used in Italy does not occur in this country, and certain well-known varieties of cement dealt with, especially those wholly or in part derived from volcanic debris, are peculiar to the peninsula.

This is not a book, therefore, in which we find many generalities of use to the English student, unless he is to be employed on constructional works in Italy, when the observations of Sig. Vacchelli become invaluable. It must not be understood, however, that the manual treats only of Italian materials and results; on the contrary, it deals also with certain English, American, German, and Austrian materials. The results obtained at official testing laboratories on the Continent seem selected for especial treatment, which is no doubt a more correct method than by giving a mass of miscellaneous data obtained under varying conditions.

The first chapter deals with the history and general nature of hydraulic limes and cements. The table on page 3 is worth a great deal. It gives the relative proportions of clay and calcium carbonate to make nine of the best known limes and cements (including pozzolana), the index of hydraulicity of each kind, and time each takes to set. The second chapter deals with certain properties of hydraulic limes and cements, including their general chemical composition and physical characteristics, such as weight, resistance, and permeability. In speaking of pozzolana, the author remarks that it is very largely used in Italy as a medium hydraulic cement. It is worked at Bacoli (in the Bay of Pozzuoli, near Naples), and at S. Paolo, near Rome. It varies greatly in colour, ranging from greenish, yellowish, and brownish to blackish, this last mentioned usually appertaining to an inferior variety of more earthy character. The density of this cement varies from 0·95 to 1·04. Good pozzolana from Bacoli should possess, approximately, the following chemical composition :—

Chemical Composition of Pozzolana.

Silica	56·20
Alumina	19·00
Sesquioxide of iron	8·70
Magnesia	0·25
Soda	2·90
Potash	3·95
Calcium carbonate	2·90
Water	3·90
Traces of calcium sulphate, and loss	2·40

From the above it will be noticed how very widely pozzolana differs from ordinary limes and cements. The calcium carbonate, instead of being a predominating factor, sinks to less than 3·0 per cent., whilst its place is largely taken by silicate of alumina, alkalis, and iron. It is a remarkable cement, and in addition to the Italian localities cited, Signor Vacchelli states that it occurs in the island of Santorin (Greece), the Azores, the Ardennes, and at Cantal in France.

The third chapter treats of official regulations as to the qualities of cements used on public works, &c. The regulations are set forth in some detail, and serve to remind the English reader that many restrictions are placed on the composition of cement in certain European countries. These rules should prove useful to British manufacturers of Portland cement, &c., who are exporters. The regulations specially mentioned are those emanating from the office of the Ministry of Commerce, Industry and Public Works of Prussia (1887); the rules drawn up by the authorities of the city of Turin (1894); and the elaborate specifications relating to Portland cement drawn up by the French Administration of Bridges and Roads (1896).

Chapter IV. describes the nature of the stony constituents used in connexion with the limes and cements already mentioned. Sand is treated in much detail, the dimensions of the grains being regarded as the prime factor in the classification of the different kinds of sand, after due consideration has been paid to the three chief kinds as determined petrologically, viz., argillaceous, calcareous, and siliceous sand. Grit and other similar constituents are also discussed. The English reader will be more particularly interested in the author's observations on the uses of lapilli, volcanic sand (called Vesuvian sand, though we know not why), and pumice. He might have given more attention to the first and last-mentioned of these volcanic products, especially in reference to the manufacture of light cement bricks—as made near Andernach (Rhine), and other localities on the Continent.

The next two chapters enter into the question of the proportions of different kinds of cement to be allowed with different grades of sand, grit, &c., to get the best results, and the method of mixing by hand and by machinery. The seventh chapter describes concrete, its antiquity and some other elementary points. Then follow particulars as to its crushing weight, impermeability, compactness, specific weight, and lateral extension, in which we see nothing of a novel character. The remainder of the book is occupied by a lengthy description of modes of construction in concrete and in cement of various types of building and engineering works, such as walls, floors, arches, bridges, tubes, conduits, roofs, &c., those of concrete first, and in ordinary cement towards the end.

We have nothing but praise for this manual, except that, in common with others in the same series, the type is too small, and the index might have been extended and drawn up in better order. A whole section under the letter P (p. 309) has gone astray.

Bruges: A Historical Sketch. By WILFRED C. ROBINSON. Bruges: Louis de Plancke. 1899.

THIS book is almost entirely occupied with a political history of Bruges; but the twelfth chapter, on "Merchants and Guilds," is of interest to those who are looking at Bruges from the architectural side, as it gives some information in regard to circumstances which influenced some of the architectural characteristics of the city, the effect of which is still to be traced. In the fifteenth century all the civilised nations of the world had their representative houses in Bruges, and the names of "Paris Halle" and "Spaniards'-street" still bear evidence of this. The author enumerates forty-seven guilds of crafts as existing in the fourteenth century, the most influential being the Carpenters and the Masons. In regard to the latter, he observes, "Many of the quaint bits of stone-carving, inserted in old houses about the city, were proofs of capacity produced by those who sought admission to this guild." The book is worth reading by any one who is about to visit Bruges, as assisting in an understanding of the relations of the older buildings to its past history.

The prosperity of Bruges always hung more or less on the rather shifting and uncertain conditions, in that flat country intersected by canals or canal-like rivers, of direct communication with the sea. In the fourteenth century this communication appears to have been so far intercepted or unsatisfactory that the principal merchandise had to come round by the Scheldt through the rival city of Ghent, where of course it encountered heavy tolls. It was the attempt of the Bruges people to turn the course of the River Lis, in the fourteenth century, in order to get a better water communication, which aroused the strife between Bruges and Ghent commemorated by

Henry Taylor in the first part of "Philip Van Artevelde":—

"The devil,
Who never sleeps, awakened them of Bruges
To dig about the Lis to turn the water."

History repeats itself in so far that the modern city of Bruges is now promoting the making of a new and wide canal to the sea, with the view of restoring her ancient prosperity. Fortunately in the present day such a scheme does not lead to an appeal to arms on the part of those who may be jealous of it.

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Following a dissertation upon mechanical drawing, the chapter dealing with the uses of squared paper is likely to be useful to those whose future duties may include the construction of diagrams showing results obtained by observation and experiment, whether these relate to engineering, surveying, or purely statistical work. The second section of the book, treating of descriptive or solid geometry, is prefaced by a chapter in which the free use of models is recommended to the beginner, so that he may accustom his mind to realise figures in space of three dimensions from representations of such figures on paper which has only two dimensions. Judging from the fact that the authors have provided in an appendix some extracts from the eleventh book of Euclid necessary for the study of solid geometry, they appear to assume insufficient theoretical knowledge on the part of the student. Possibly this assumption is justified by facts, but it cannot be too strongly emphasised that familiarity with theoretical principles ought always to precede the study of methods for applying such principles in practice. Problems considered in the earlier chapters of the second section are devoted to figures in projection made up of points, straight lines, and planes, whilst attention is afterwards given to solids bounded by curved surfaces, to surfaces in contact, the interpenetration of solid bodies, shadows, and metric projection. Treatment of the two last-mentioned matters appears to be regulated entirely by South Kensington standards, and some readers may regret that these branches of the subject are not more fully discussed. The same remark applies to the section on graphics, which is of the most scanty proportions. As the authors express the view that "a fuller conception of the scope and province of practical geometry is needed," and one which sees in it "a powerful instrument of mathematical investigation," we are somewhat disappointed to observe that so feeble a demonstration has been made of the usefulness of this "instrument" for furnishing graphic solutions of statical problems.

A Digest of the Law of Easements. By L. C. INNES. Sixth edition. London: Stevens & Sons, Limited. 1900.

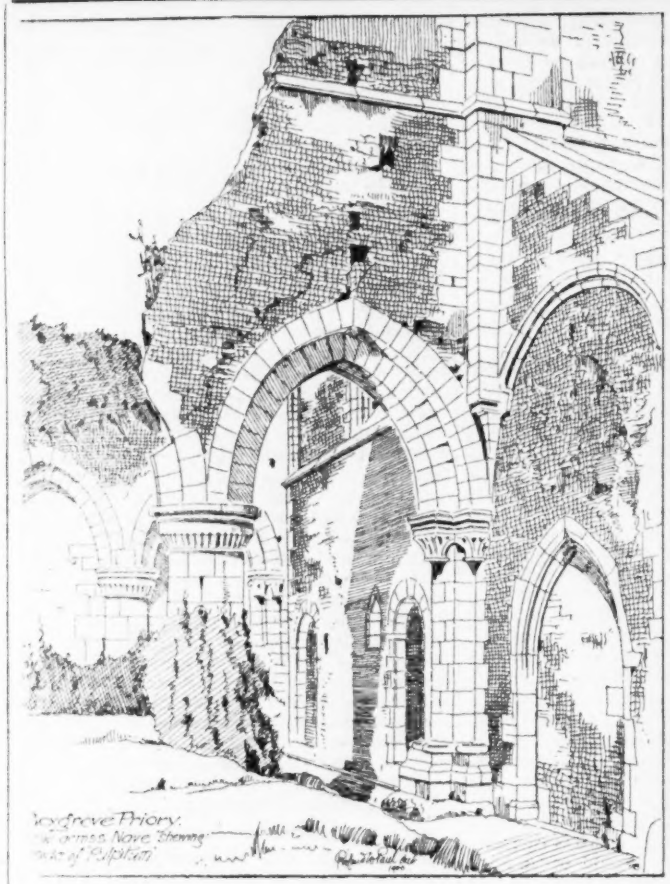
WE are glad to welcome another edition of this excellent work. It is only (including the index) 130 pages in length, but it may fairly be said to contain in codified form the law relating to easements. It may be well to give an example. We take it from that part which is concerned with the right to support. "A right of easement may be acquired by grant or prescription to the support of *buildings* by the adjacent or subjacent soil. There is no natural right to such support." This is the way in which law books should be written on clear and well-ascertained branches of the law. Then they are as useful to laymen as well as to lawyers. There is only one point as to which we desire to make a protest. The price of this little book is 7s. 6d. It ought to be 3s. 6d. Not one lawyer or layman in a hundred will buy the book at its present exorbitant price. When a book is largely and necessarily costly to produce, and is intended only for lawyers, it is reasonable to publish it at a high price. But this reason does not apply to a small book intended for laymen as well as lawyers.

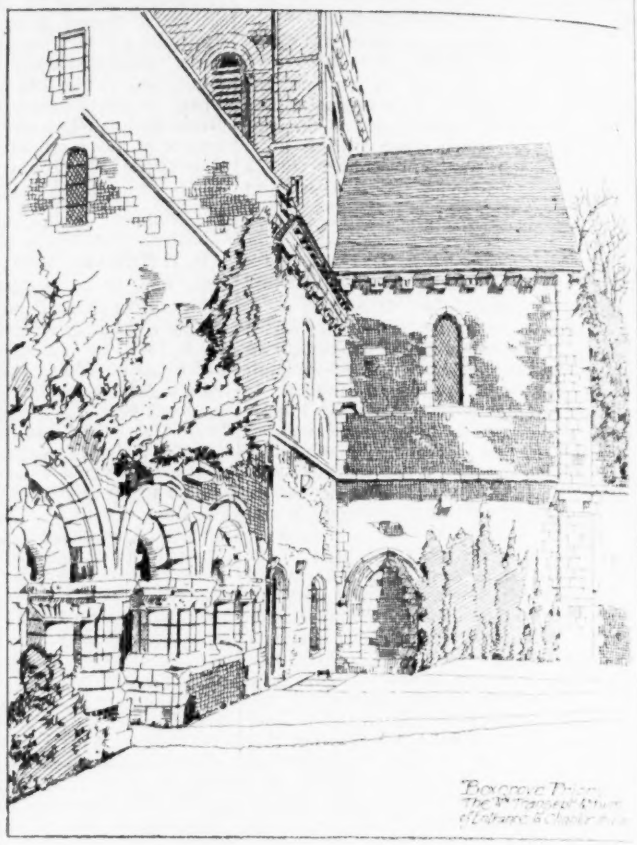
The Management of Dynamos. By G. W. LUMMIS-PATERSON. London: Crosby Lockwood & Son. 1900.

THE second edition of this useful work has been revised and slightly enlarged. The main addition is a chapter on the construction and management of motors. Since we last reviewed this book in these columns we have had occasion to recommend it more that once to electricians and others who have little experience of dynamo working. To these its principal use is something to fall back on in case anything goes wrong, but it also contains many useful hints which, if attended to, will greatly lengthen the life of the machine and prevent breakdowns.

The "Practical Engineer" Electrical Pocket-Book for Manchester. The Technical Publishing Company. 1900.

THIS is an excellent pocket-book for electricians, and it is published at a very moderate price. Unlike other books of its class, there is very little antiquated matter in it. The brief descriptions of apparatus and the short *résumé* of theory are very well done. For a first edition the tables and formulæ are remarkably free from errors. It would be better, however, if the limitations of the theory given were mentioned. The reader would naturally think that the power expended in an alternating current circuit was simply the ohmic loss (C^2R). The theory of alternating





currents, leaving iron out of account, is very pretty and instructive, but it is not practical. In the test for leakage, by using two glow lamps in series, it ought to be stated that the method is not applicable to houses supplied from the street mains. In testing the house wiring, it is stated that the insulation resistance of each conductor to earth should be found. The method of doing this, however, is not given. The simplest way is by taking three separate readings with an Evershed ohmmeter in the manner first described in the *Builder* three or four years ago, and now well known.

The "Electrician" Electrical Trades Directory and Handbook for 1900. London: The *Electrician* Printing and Publishing Company. 1900.

THE increase in the bulk of this volume testifies to the continued prosperity of the electrical industry. Considerable additions have been made to the very useful information printed at the beginning of the book. The Model Telephone Licences have been included, although only issued by the Postal Telegraph Department last month. There is also given the report of the committee appointed to consider the standards for copper specifications issued last December, and the Telegraph Act, 1899, is given in full. Articles on "Free Supplies of Incandescent Lamps" and "Easy Wiring Systems" give trustworthy information on topics of great interest to corporations. The numerous tables given are valuable, and are very convenient for reference. We know of no other work that will give such assistance to all connected with the electrical industry. It will prove particularly useful to the committees, all over the country, which have been formed to discuss the subject of electrical supply, whether for lighting or traction, and the establishment of telephone exchanges.

BOOKS RECEIVED.

THE TRIBUNAL OF APPEAL UNDER THE LONDON BUILDING ACT. By Chas. H. Love. (P. S. King & Son.)

THE ANNUAL OF THE BRITISH SCHOOL AT ATHENS: Session 1898-99. (Macmillan & Co.)

LEICESTER-SQUARE.—In our last issue we referred to the rebuilding of Messrs. Puttick & Simpson's Sale Rooms at Leicester-square, and we stated that the work is being carried out after the designs of Mr. Arber. We are informed that this is incorrect; Messrs. Edmund Wimperis & East are the architects.

Illustrations.

BOXGROVE PRIORY.

THE Priory Church of Boxgrove stands about four miles east of Chichester, not far from Goodwood Park, on a sheltered site between the South Downs and the sea. Here, in the early years of the twelfth century—the date is generally given as 1117-1135 — Robert de Haye, or de Haia, founded a priory for Benedictines. To the three monks introduced by him three more were added by Roger de St. John, who married Cecily, daughter of the founder. The establishment was further increased in number to thirteen in the time of William de St. John, eldest son of Roger, the full number of fifteen being completed shortly after. The Priory was a cell to the Abbey of Essay, in Normandy. Various grants of land were made to the Priory by its many benefactors, and in the thirteenth century it would appear to have reached the zenith of its prosperity; this is borne out by the architectural evidence. The Priory was dissolved in 1535, and passed to Sir Thomas West, Lord de la Warr, for the sum of 136*l.* 13s. 4d.* It is now the property of the Duke of Richmond and Gordon.

The present remains include the choir, transepts, and a part of the nave now roofed and forming the parish church; also a considerable part of the north and west walls of the remainder of the nave, the entrance to the chapter house, various foundation walls north of it, and at some little distance, a building, now detached, and commonly called the "Refectory," which once formed part of the group of monastic buildings arranged round the cloister court. The cloister court has determined the somewhat curious placing of the nave, and its retention in its original form has caused the western arm of the church to assume the unsymmetrical appearance that will be seen by the ground plan.

The part of the church retaining Norman work and work with Norman influence includes the "crossing," transepts, and the nave; also the entrance to the chapter house. The work is distinctly of two dates. To the earlier—and perhaps to the original foundation of Robert de Haia—belong the walls of the transepts, the entrance to the Chapter House, and the north wall, and two arches on the south of the nave which are now included in the present church. Everything west of this is Transitional work, with groups of columns round a cross-shaped pier alternating with circular columns. The arches are pointed, and the foliage, where introduced, is of that stiff form characteristic of the first change from Norman to early English. Whether or not a central tower was part of the original design, it is evident that the present tower is of the second period, and the breaking of the jointing between it and the original work of the transepts is very clearly marked. The presbytery was no doubt apsidal, with flanking chapels on the east side of the transepts approached through the arches that now lead to the choir aisles. The transepts had windows on both east and west faces, and no doubt on the south as well. These still exist, blocked up by later work. The chapter-house adjoined the north transept, and extended eastward for 11 ft. beyond it. In the space between it and the choir was a small room or approach, and a "squint" was formed in the east wall of the transept, which can still be traced both on the inside and outside. There is a doorway in the north wall of the choir now blocked up, which apparently led to it, but this is later work. The south wall of the transept has been disturbed by the insertion of Perpendicular windows; the east window of the south transept has been filled by a niche of the same date, and the north transept on its west side has been pierced by two doorways—one near the angle with the nave, of Perpendicular date, and another one near the north-west angle, of modern work. In the north wall of the nave is a large doorway also of Perpendicular character, leading from the church to the cloister. The total interior length of the nave when complete was 115 ft. The first 15 ft. westward of the crossing belonged to the monastic church. At this point a stone screen crossed the church, pierced by two doors with the nave altar between them. This wall is about 5 ft. thick, and still retains the doorways (now blocked) and a piscina of curious triangular shape. It seems evident that this wall has been considerably restored, if not entirely rebuilt, but the doorways and other features are ancient. Of the remaining length of the nave, the eastern half of it had no north aisle. This was its original plan, and, the first cloister being retained, no aisle for this distance was ever built. The western half, however, clear of the cloister, had a north aisle, and the west end thus was symmetrical in appearance. The north wall of this aisle has been a good deal altered from time to time, but it is largely original, and the fragment of the west wall still remaining still retains the

* Dugdale.

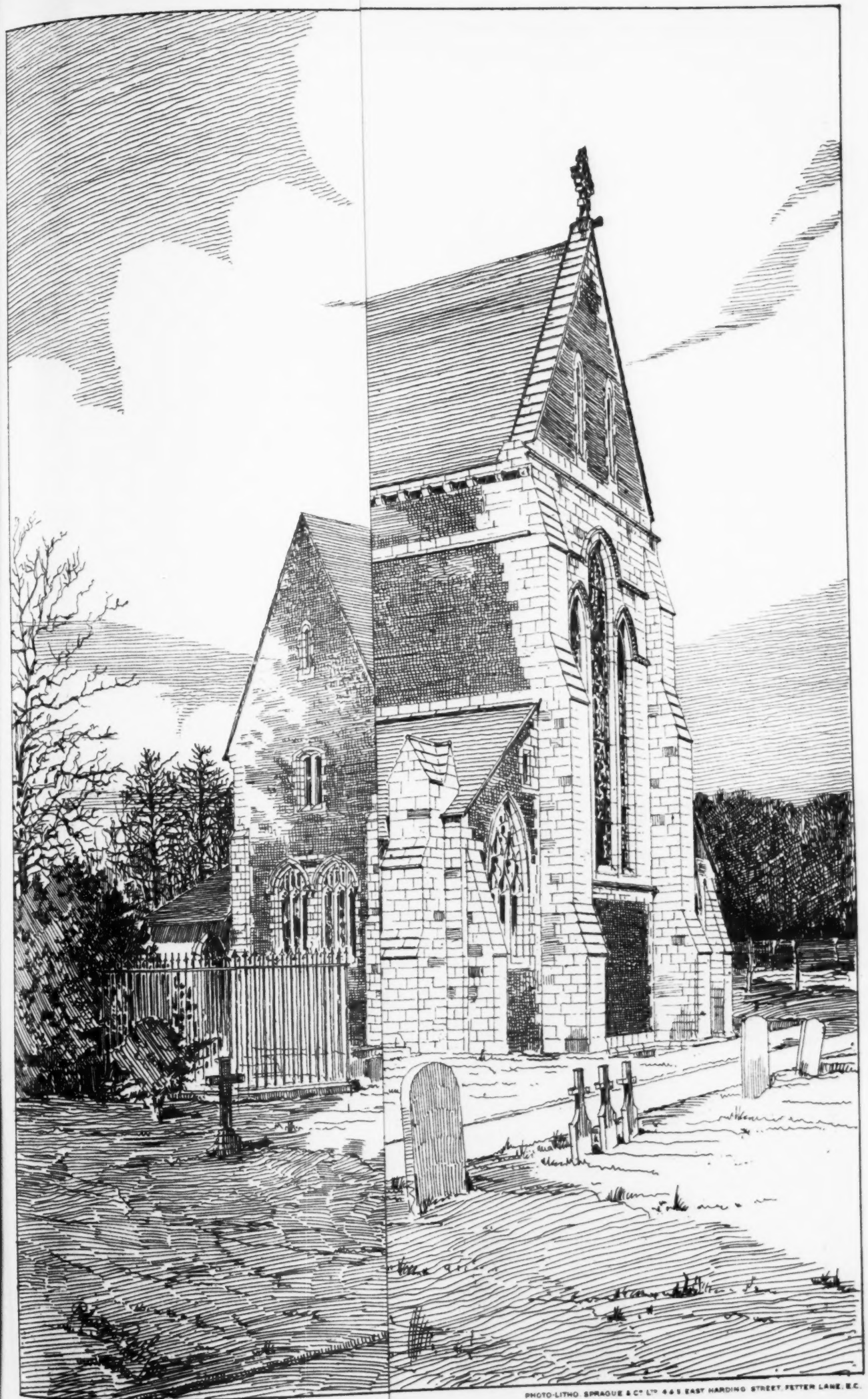
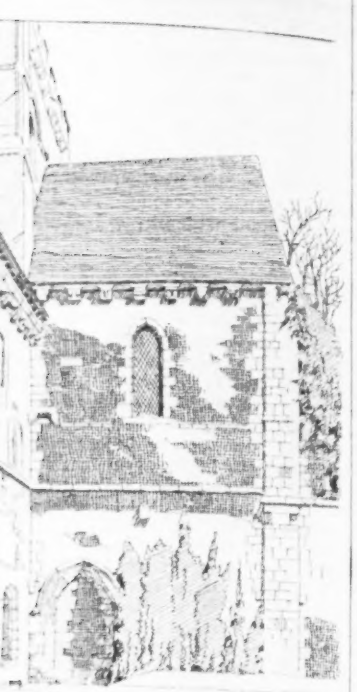


PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.



Bingrove Priory.
The Pilgrims' Way.
Messrs. Chester Price

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THE ABBEYS OF GREAT BR

DRAWN BY MR. F

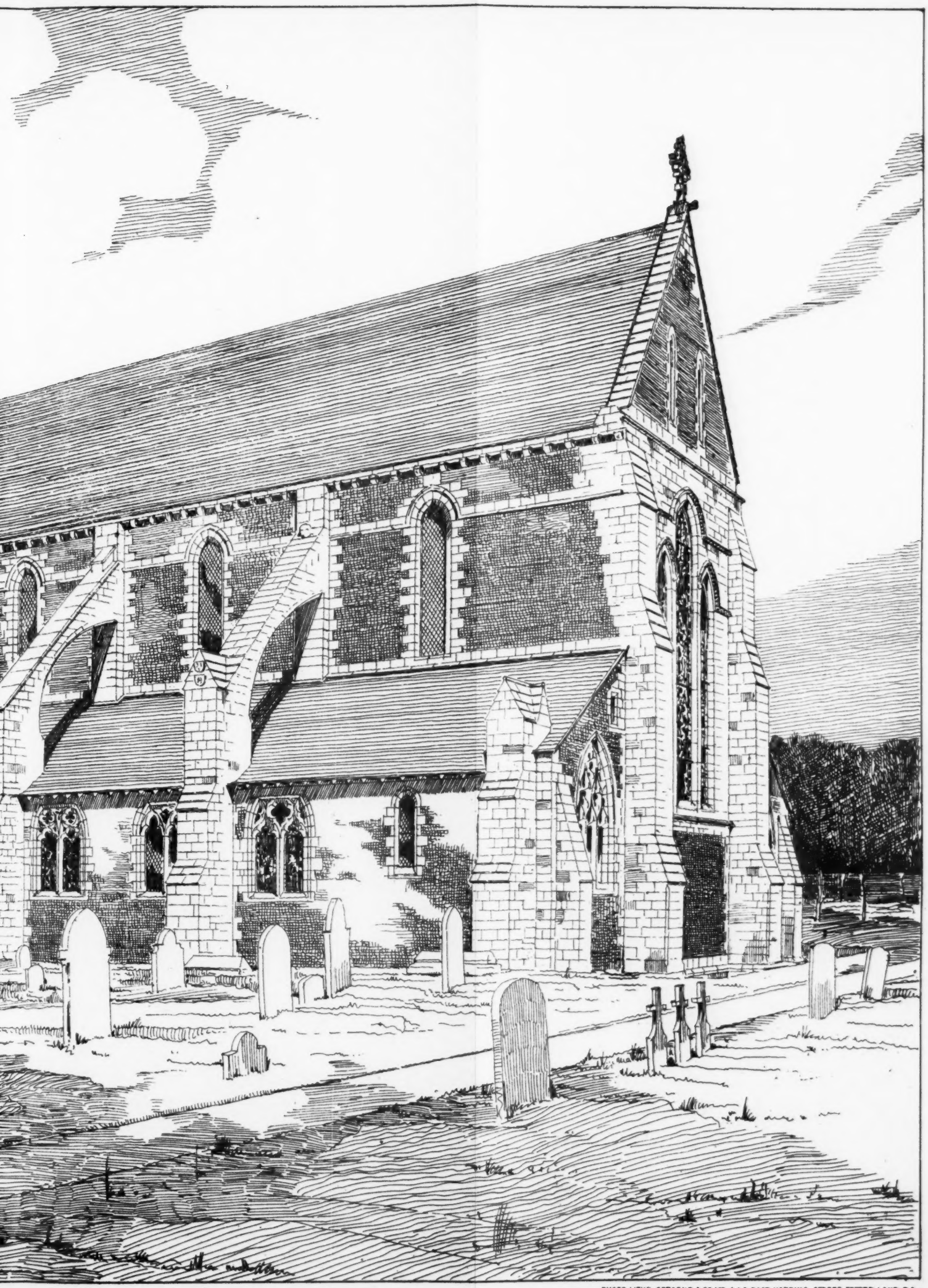
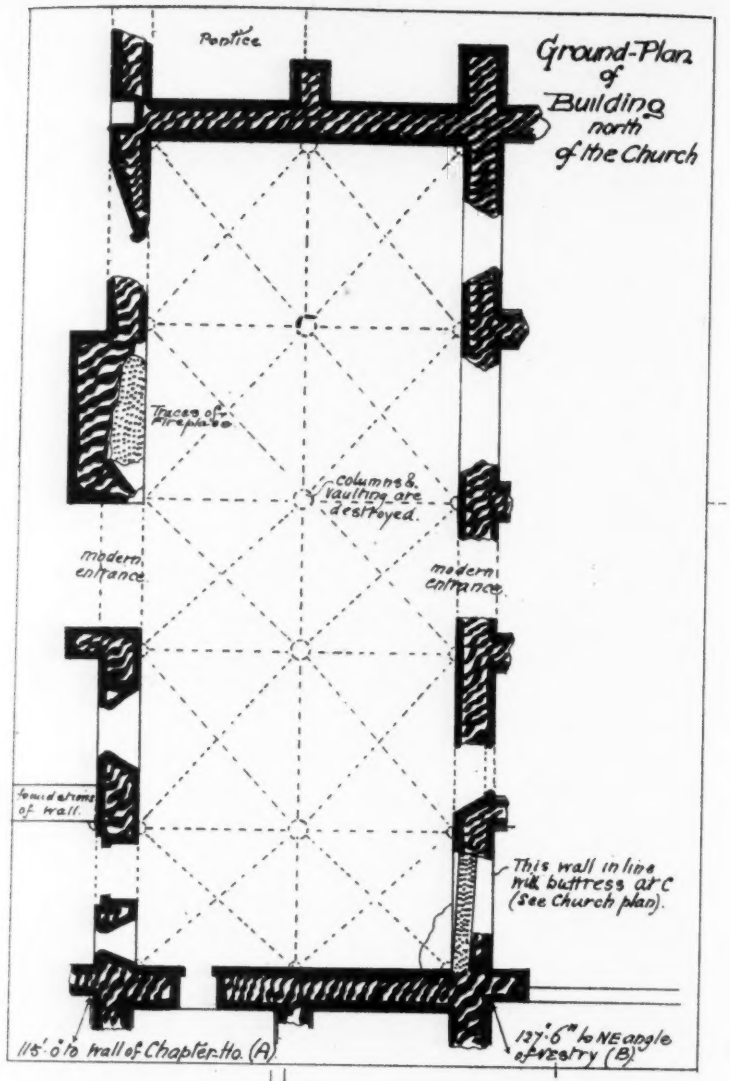


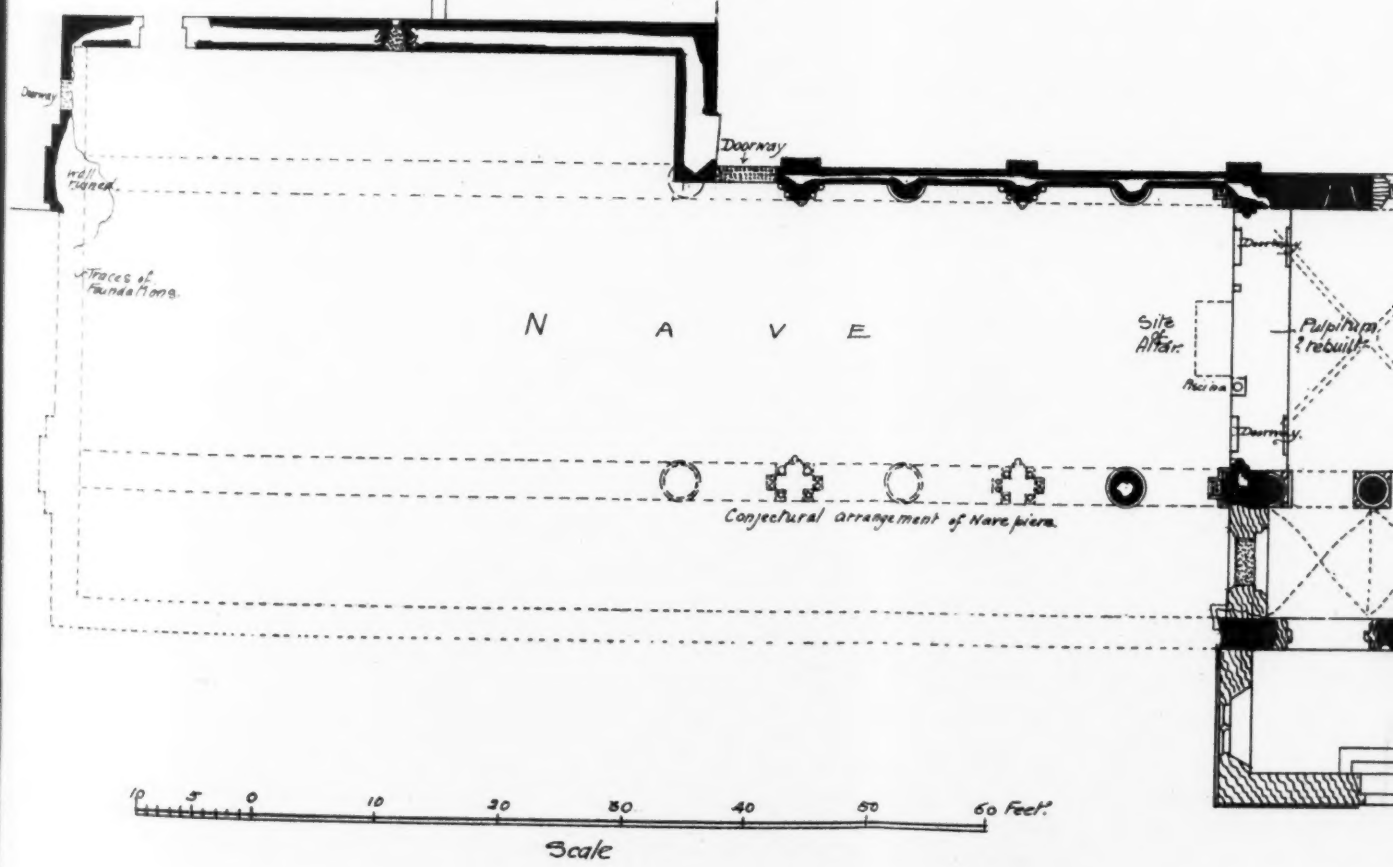
PHOTO-LITHO SPRAGUE & Cº Lᵀᵈ 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

REAT BRITAIN. No. 33. BOXGROVE.

WN BY MR. ROLAND W. PAUL


Ground-Plan of Building north of the Church
Portico
Traces of Fireplace
Columns & vaulting are destroyed.
modern entrance
modern entrance
Rounded ends of wall.
This wall in line with buttress at C (See Church plan).
115'-0" to wall of Chapter-Ho. (A)
127'-6" to NE angle of vestry (B)

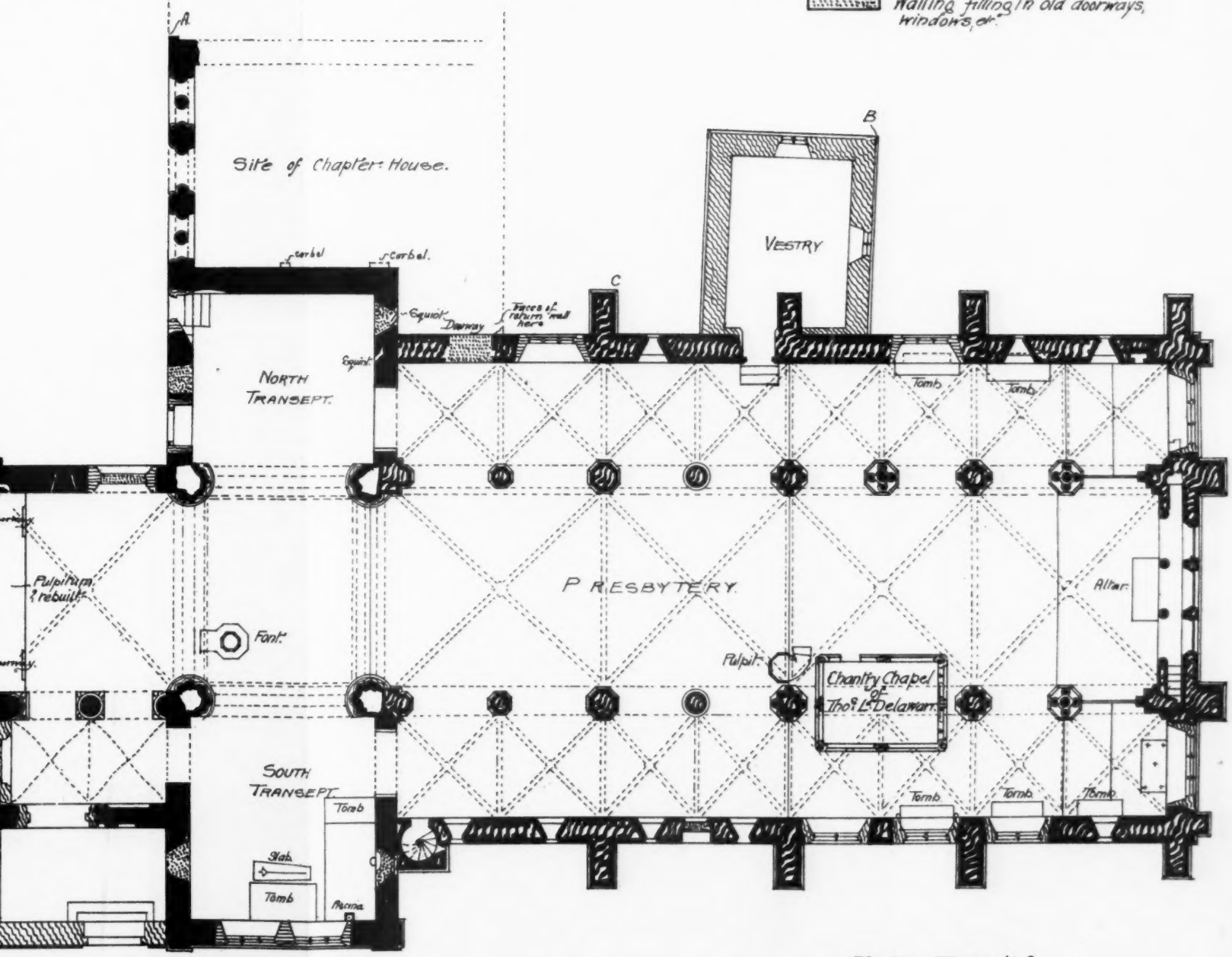
Site of Cloister.



BOXGROVE PRIORY.

Ground-Plan.

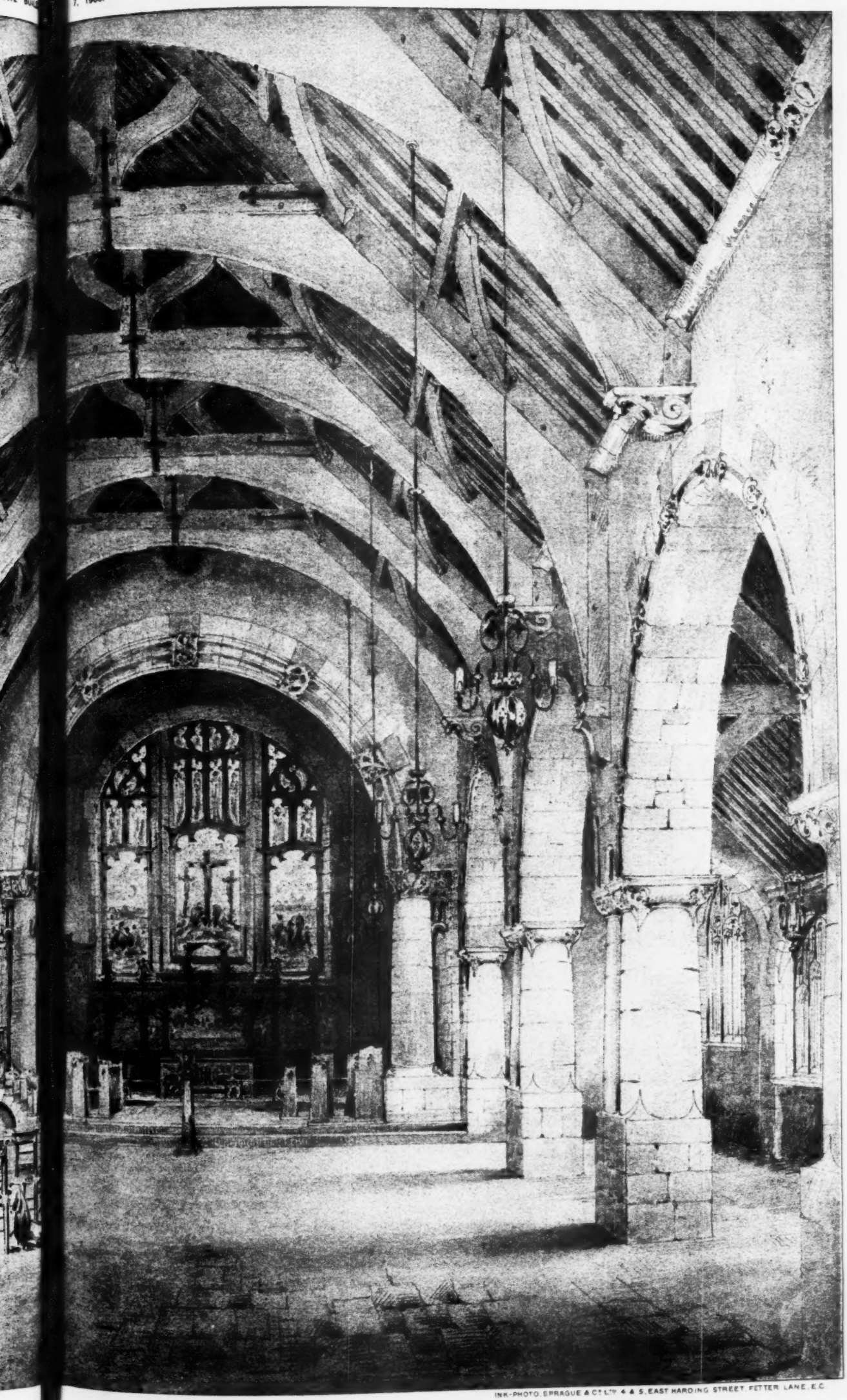
Norman.
Transitional.
Early English.
Decorated.
Perpendicular.
Walling filling in old doorways, windows, &c.



The Nave, Transepts, & Presbytery based on plan by Lacy W. Ridge with additions
Rpd. au. Paul.

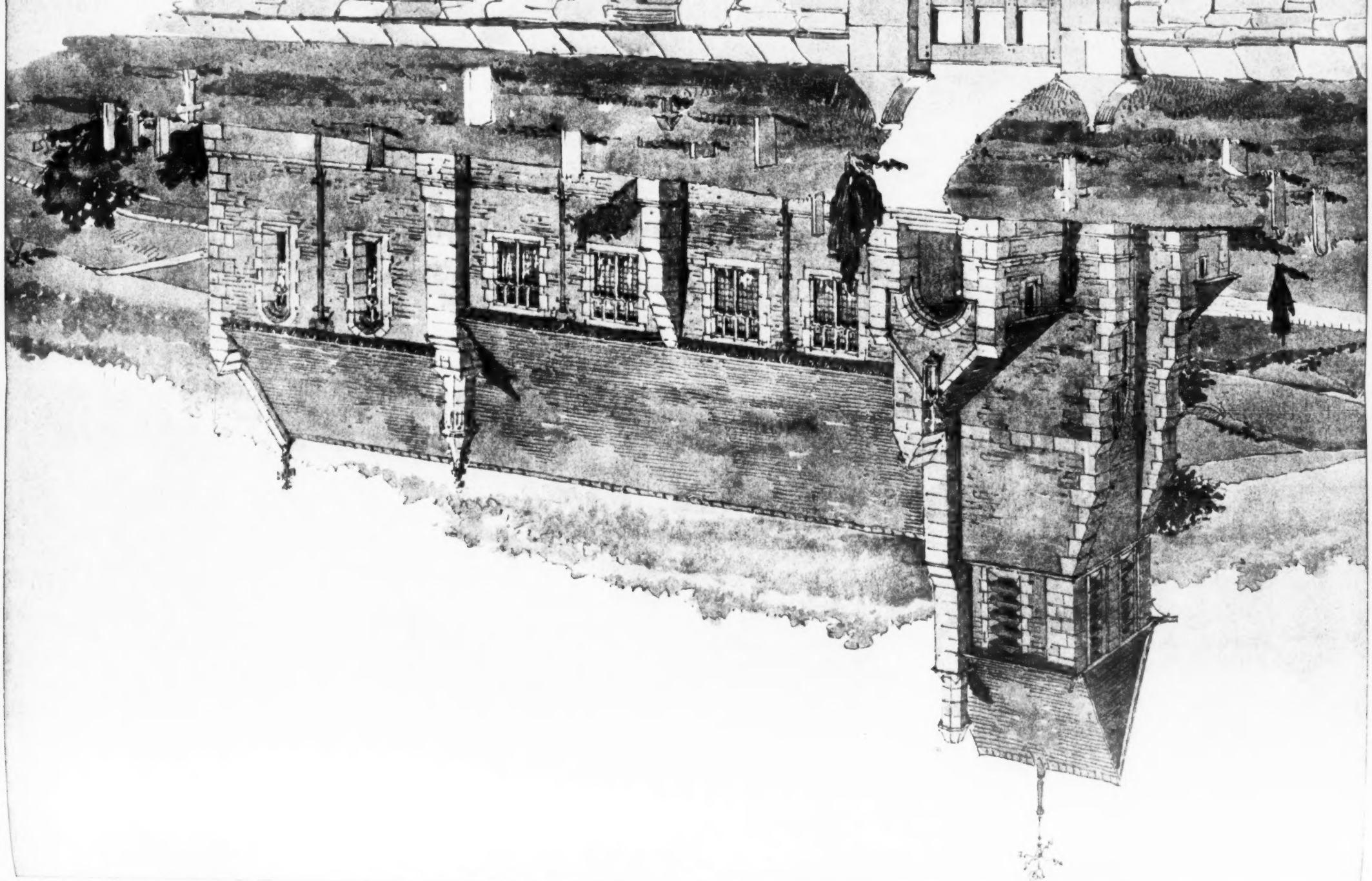
PHOTO-LITHO SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

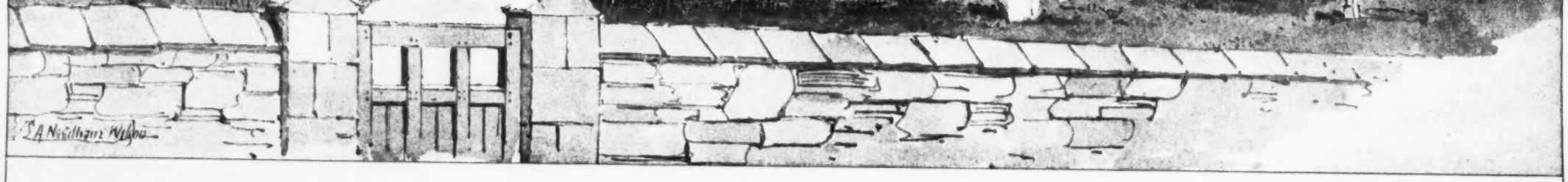
ST. LUKE'S NEW PARISH CHURCH, MAIDSTONE



INK-PHOTO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DSTONE. NT.—Mr. W. Howard Seth-Smith, F.R.I.B.A., Architect.



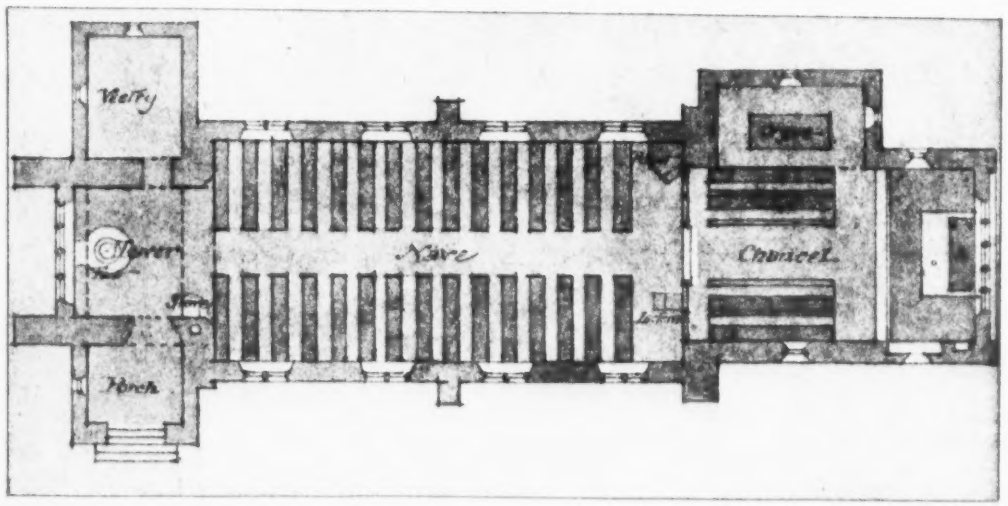


View from Road

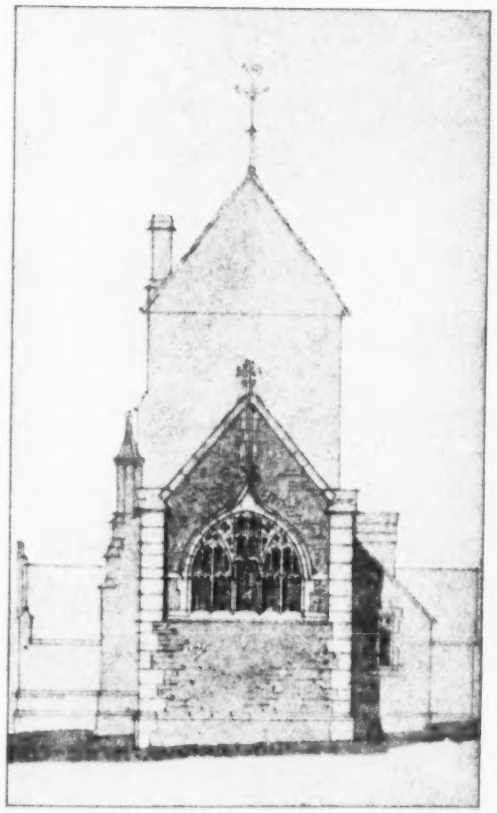
Church at Ford – Willshire

C.E. Ponting F.S.A. Architect

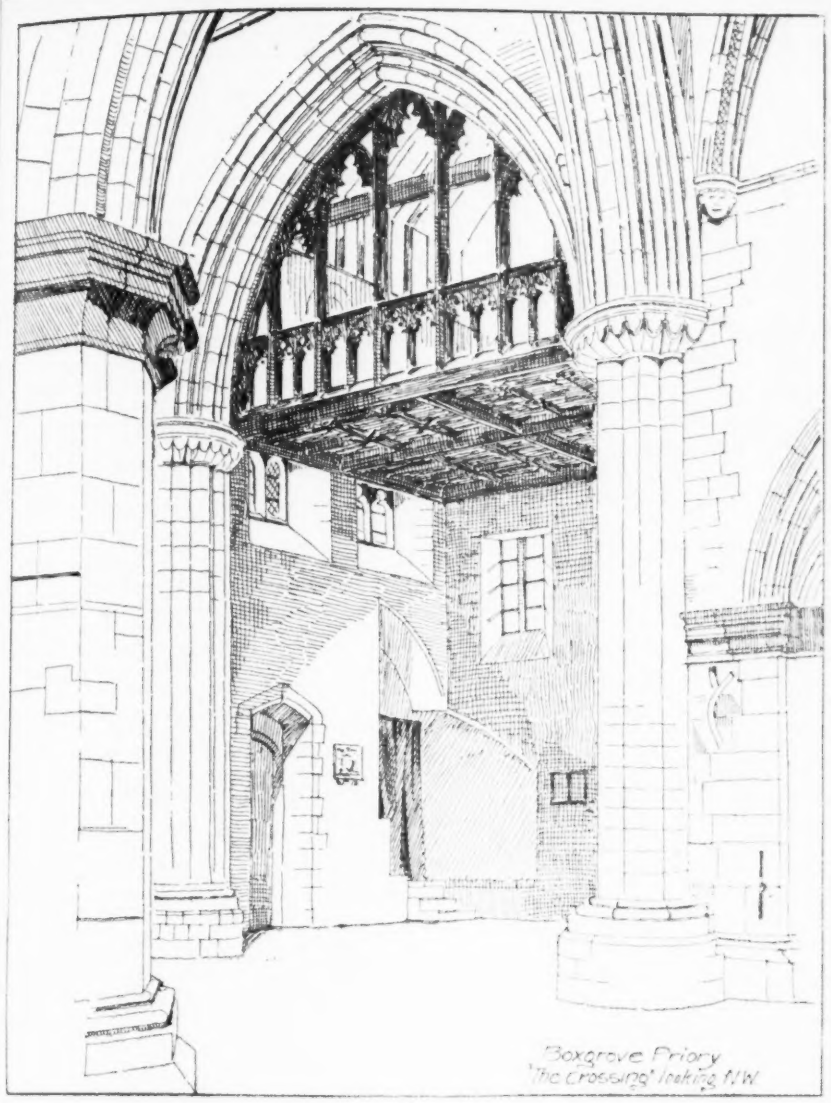
Section



Plan



East Elevation



pilaster buttress that stood against the respond of the nave arcade. The conjectured completion of the plan of this part of the church is shown by dotted lines; a good many of the foundations of the west and south walls have been found.* This part is now, however, a part of the parish graveyard, and no systematic examination is possible. There was a doorway (now blocked) between the cloister, at its south-west angle, and the nave.

The first, and, in fact, the only, great alteration to the Priory Church took place in the thirteenth century, when the presbytery was rebuilt on a grand scale. No doubt the work was commenced from the east, and when it was sufficiently advanced, the existing Norman presbytery was pulled down and the new design completed. It consists of four bays with aisles, the western bay being of greater span than the others. The exterior in every respect is of the simplest possible design, with a single lancet in each bay of the clearstory and two in each bay of the aisles. At the east end is a lofty triplet, with dog-tooth introduced in the labels. A corbel table carries the main roof, which is supported by bold flying buttresses. The aisles have eaves. The materials are flint for the walling, and stone dressings, the only portions entirely ashlar being the buttresses and the east front between the cills of the lancets and the springing of the main gable. With the exception of the introduction of windows of Decorated and Perpendicular date, the exterior has been practically unaltered.† The interior is likewise simple in design, but considerable effect has been obtained by a lavish use of Purbeck in the shafts, piers, and caps both of the main arcade and the clearstory. Each bay is subdivided by a column or group of columns. The arches are pointed and richly moulded. Over and between them is a sunk quatrefoil panel, the whole being enclosed in an arch of semi-circular form. The arches of the two eastern bays are carried by clusters of alternately detached and attached columns round a central pier of circular or quatrefoil section. The western piers are, however, plainer, being either circular or octagonal. The length of the presbytery is 82 ft., its width 47 ft. The Decorated style has left examples of windows inserted in the south aisle, and in the east front, at the ends of the aisles, and to a rather later date, belongs the vestry, on the north side of the presbytery, which has a marked deviation to the north-east from the main lines of the building. It is chiefly remarkable on its exterior for a large cross of squared flints, the terminations of the arms being roughly fashioned to represent fleur-de-lys, inserted in the north gable over the window. The porch on the west side of the transept—now the chief entrance to the church—is also of Decorated date.

The Perpendicular period is represented by windows—two in the north aisle of the presbytery and two in the south face of the transept; and the font is of this date also—octagonal, with quatrefoils in circles on each face of the bowl, and a panelled shaft. The large doorway near the north-west tower pier, leading from the church to the cloister, is of late Perpendicular work. The church, with the exception of the "crossing" and transepts, is vaulted throughout.

Beyond the main architectural features there are no details of any particular importance in either the ruined part of the nave or in the two bays now incorporated with the church. On the arcade, however, of the latter, on the south side, are traces of a beginning of the introduction of chevron moulding on the arches, and in some places the caps are more ornamental than in others. The font stands at present in the "crossing" near the south-west pier. The most striking features of the transepts are the two wooden galleries, their floors being level with the springing of the tower arches, and the space above being filled with tracery. The ceilings are flat, with intersecting mouldings and bosses. The approach to the gallery on the south side is by the staircase in the south aisle of the choir. There is no access at present to the gallery in the north transept, but on the exterior of the west wall are traces of a gallery with a doorway in the centre, now blocked. The approach seems to have been from the dortor which ran north from the transept over the chapter-house. The use to which these galleries were put has not been definitely ascertained.* The walls of these transepts are an interesting study, and since the restoration a good many of the earlier features have been exposed. Passing again to the eastern arm of the church, there are some interesting traces of colour on the south side of the western respond of the north arcade. There are traces in both responds also of mortices for screens. No doubt there were others, but they have in places been filled in in modern times.

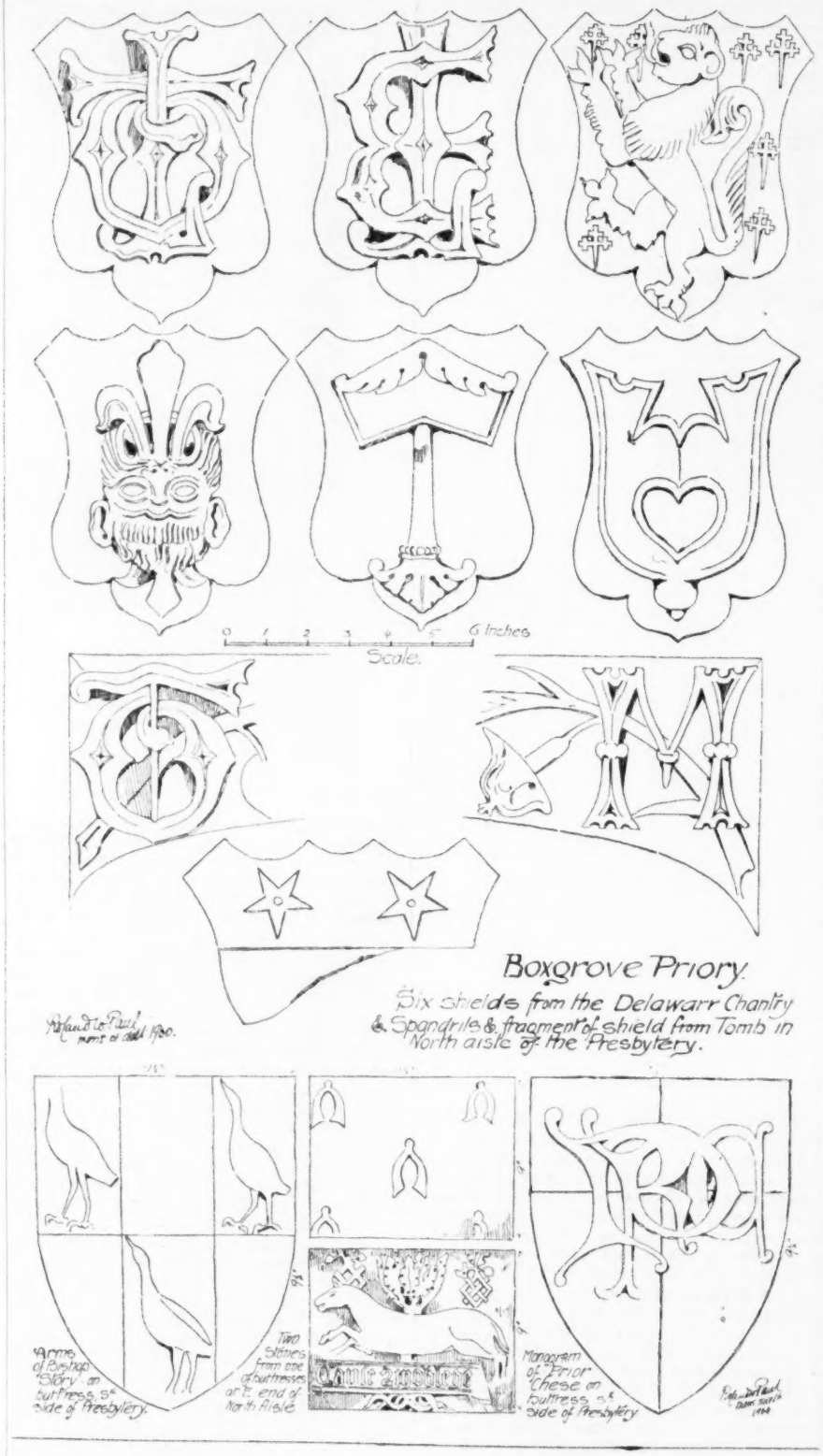
In the transepts and presbytery are some interesting tombs. First, for size and importance, is the Chantry Chapel, erected by Thomas Lord de la Warr for himself and his wife Elizabeth. It is dated 1533, and shows that feeling for Renaissance detail that is so common to many of the monuments of this district, notably at the not far distant church at Arundel. The chantry is profusely decorated with armorial shields and badges, the arms of the Le Warrs quartering St. John, Mortimer, and other coats, and their badge the chape or crampet.† On the opposite side of the church, in the north aisle, is a smaller monument of the same date. In the spandrels are the letters "T. M.," with flowers introduced of the same kind as on the De la Warr chantry. It probably is the tomb of Thomas Myles, the last Prior, who resigned in 1535. The arms of the De la Warrs and their connexions, again surrounded by floral decoration, occur also on the curious painting on the plaster of the choir vaulting. This work, although much later in date than the vaulting itself, is highly interesting, and resembles the work in the Lady Chape at the neighbouring cathedral at Chichester. There are several other tombs, chiefly panelled, of the fifteenth century, and of Purbeck marble—one in the north aisle, three in the south aisle, and two more in the transept. These latter have had brasses removed. Against the west wall of the north transept is a tablet with a good example of shield, crest, and mantlings to the memory of Richard Hobson and Martha his wife, dated 1595, and in the same transept is a monument to Mary Countess of Derby,

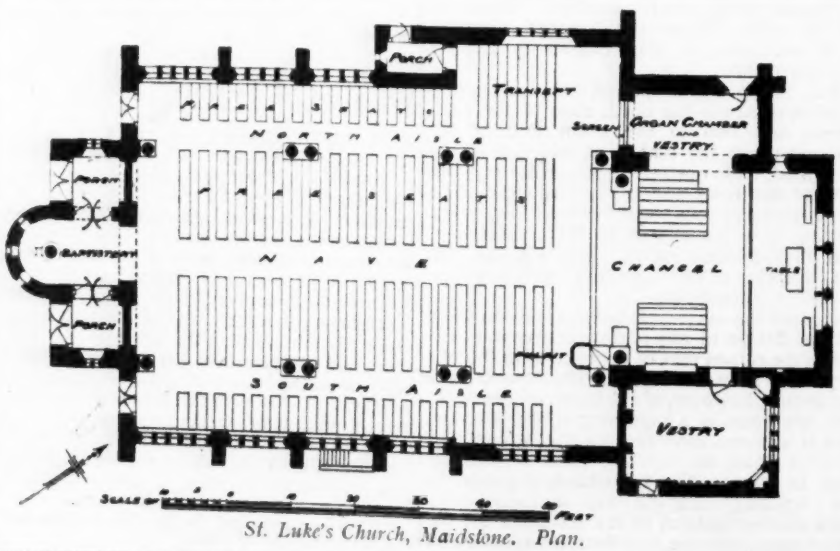
* "Historical Remarks on the Priory and Church of Boxgrove:" by the Rev. Wm. Turner.

† Two out of the three windows on the south side are modern.

* It has been suggested by Mr W. St. John Hope that one was used for the organ.

† The decorated end of a scabbard.


0 1 2 3 4 5 6 Inches
Scale.
Boxgrove Priory.
Six shields from the Delawarr Chantry & Spandrils & fragment of shield from Tomb in North aisle of the Presbytery.
Arms of Bishop Storey on buttress S. side of Presbytery.
Two stones from one of buttresses at E. end of North Aisle
Monogram of Prior Chese on buttress S. side of Presbytery



St. Luke's Church, Maidstone. Plan.

daughter and co-heiress of Sir W. Morley, K.C.B., of Halnaker, and wife of James tenth Earl of Derby. She died in 1752.

The position of several altars is clear. The nave altar stood where shown on the plan, against the west side of the stone screen, west of the "crossing." On either side was a doorway. In the south transept the altar pace remains, and at the east end of the north aisle is an altar slab, with the five crosses on it, surrounded by some early tiles, with quaint representations of animals and birds. The high altar is at present against the east wall. Its original place was clearly in the second bay of the presbytery, the De la Warr chantry being on its right hand. The easternmost bay would have been occupied by the altars and a procession path, or ambulatory. On the exterior of the building are one or two details of interest. The easternmost flying buttress of the presbytery is finished with a small gable. On this are two shields, one above the other. The upper one is charged with three storks, the arms of Bishop Storey, of Chichester, and the lower one has the initials "P. R. C.," for Prior Richard Chese, 1483. The bishop and the prior were contemporaries.

On the face of the north buttress of the north aisle are two stones, each measuring about 11½ in. by 9 in. The buttress has evidently been rebuilt and the stones, cut down, inserted. One has a good carved representation in low relief of the horse of the Arundels, with a scroll below and the words, "Cause m'oblege," the other with five "chapes" of the De la Warrs. Doubtless these were brought from some tomb now destroyed and built in with a view to their preservation. These stones are illustrated, also the shields on the south side, and some of the lesser shields with badges from the De la Warr chantry.

Of the monastic buildings only one fragment of any importance is still standing. It is a building about 65 ft. long and 25 ft. broad, formerly divided into three stories. The lower or ground level was vaulted, the vault being carried by wall corbels and a row of four columns down the centre. In the west wall are remains of a large fireplace, into which some herring-bone work has been introduced. There were entrances on three sides—one on the east, one on the south, and two on the west. It stands about 150 ft. north of the church, its east wall being in line with the east face of the buttress between the vestry and the north transept. It is apparently of late Early English work. There was a building, shown in old prints, attached to its north-west angle.

The plan which is published to-day is based on a careful plan made some years ago by Mr. Lacy W. Ridge. He has kindly placed it at our disposal, and it has been traced, the dates or styles added, and other additions made, including the completion of the nave and the plan of the detached building just described. The conjectural lines of the nave, cloister, and chapter-house are also given, and the present position of the font and pulpit—the latter an addition of recent years.

A good deal has from time to time been written concerning the Priory buildings and their history. Besides the information and view in Dugdale showing the south-west view of the church at that date, are papers by Rev. J. Petit, dealing with the architectural history of the Priory, illustrated with ground plan and details; historical remarks by Rev. Wm. Turner, vicar; and a paper by Rev. Edward Turner, in Vol. xv. of the "Sussex Archæological Collections." The ground plan, by Mr. Lacy Ridge, is one of a series of measured drawings of the Priory church, made in 1864, which are a valuable record of the building and its state at that time.

The general view is taken from the south-east, just inside the churchyard wall. Other points of interest in the exterior interior are illustrated by the blocks in the text.*

ST. LUKE'S NEW PARISH CHURCH, MAIDSTONE, KENT.

THE requirements of the Building Committee were, in the case of this church, somewhat unusual. There was to be no clearstory, the roof being kept low to secure good acoustic properties. The result is all that could be desired. In spite of the lowness of the roof, which gives a peculiar external effect, the

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of Boxgrove Priory. For the list of Abbeys which have already appeared and for particulars of future arrangements, see page i.

ventilation and heating of the church is very successful, the radiators encased beneath each window thoroughly warming a large body of fresh air as it enters the building. There is a powerful gas-burner beneath the shaft of the Boyle's ventilator in the flèche.

The interior is faced with plaster of a warm tone, and is dressed with Bath stone. The stone carving in the chancel and that of the chancel arch is by Mr. Aumonier, and the remainder by Mr. Gilbert Seale.

The whole of the chancel fittings are in picked teak, the stalls being made and carved by Messrs. White Allom; the organ case, transept screen, and lectern by Mr. Lawrence Turner; and the reredos and Holy Table by Messrs. Jones & Willis. The brass and wrought-iron gas pendants and the communion rail were by Mr. Bainbridge Reynolds.

The chancel and baptistry paving is of bluish-green Rust's mosaic.

The builders were Messrs. Wallis & Sons, of Maidstone; and the architect Mr. W. Howard Seth-Smith.

CHURCH AT FORD, WILTSHIRE.

THIS church was erected in accordance with a design exhibited at the Royal Academy in 1898, and of which the interior view, and a small elevation sketch of the east-end, appeared in our issue of December 4, 1897.

The drawing here published was made to show an alternative treatment of the lower and some other features.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY. — A lecture, entitled "Notes on School Buildings," was delivered on the 2nd inst. to the members of the Liverpool Architectural Society by Mr. E. P. Hinde, A.R.I.B.A. The lecturer urged that school buildings should be well lighted and warmed, and care be taken to prevent draughts. Sanitation was no less desirable in a school than in a hospital. He advocated asphalt or concrete playgrounds, and dust should be scrupulously kept out of corners. All plans should be conceived in a spirit to suit the requirements of the next generation. The present tendency was to make class-rooms too small, especially in the infant departments.

THE LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A general meeting of the Leeds and Yorkshire Architectural Society was held on the 2nd inst. at the offices of the hon. secretary (Mr. Francis W. Bedford), Greek-street Chambers, Leeds, when the following officers were elected for the ensuing year:—President, Mr. W. Carby Hall; vice-presidents, Mr. C. B. Howdill and Mr. W. H. Beevers; hon. treasurer, Mr. W. H. Thorpe; hon. librarian, Mr. W. H. Beevers; hon. secretary, Mr. F. W. Bedford; and hon. auditors, Mr. F. Musto and Mr. Hambler. The Council was elected as follows:—Mr. G. W. Atkinson, Mr. W. S. Braithwaite, Mr. J. F. Bowman, Mr. A. R. Hill (Bradford), Mr. T. Butler Wilson, and Mr. R. Wood.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of this Society on Monday, Mr. Henry O'Connor, President, in the chair, a paper was read on "The Disinfection of the Maidstone Water Service Mains," by Dr. G. Sims Woodhead, M.A., and Mr. W. J. Ware, Memb. Brit. Assoc. of Water Engineers. After briefly describing the position of Maidstone and the growth of its population, the authors gave an account of the conditions under which it was found necessary to carry out sterilisation of the mains in order (1) to do away with the possibility that any infective material that might have made its way into the mains should remain in any of the pipes, especially in the dead-ends; and (2) to restore public confidence, which could only be done by rendering it absolutely impossible for any such infective material to remain. For the disinfection chloride of lime was used because (1) of its comparative cheapness; (2) of its efficiency as a disinfectant, especially in solution, the double action of chlorine and oxygen being of special importance; (3) under the conditions presented it could easily be obtained in a clear solution of the required strength; (4) it exerts comparatively slight action on lead; (5) its action on leather was supposed to be less than was afterwards found to be the case; (6) the odour could not be mistaken, and there could be no doubt when the chloride of lime had reached its destination; (7) after the pipes had once been washed out there could not be the slightest danger of any ill effects following from the use of chlorinated water. In each of the streets from which complaints were received, the water supply was suspended and the mains emptied. The empty mains were then charged from the highest point with chlorinated solution stored in water vans. The sluice valve was then opened, and the normal pressure was brought to bear so as to force the solution contained in the mains through the services and fittings of the selected houses. Apart from some damage to washers, clothing, and pump-buckets, no ill effect of any kind was traceable to the use of the chlorinated lime solution. As a result of the treatment everyone was satisfied that, so far as the mains and service pipes that conveyed the high pressure water were concerned, there was no possibility that any typhoid organisms could continue to exist in them.

The Student's Column.

DETAILS OF STRUCTURAL IRON AND STEEL.

13.—RIVETTED JOINTS (*continued*).

FRICTION of the plates in a joint, due to contraction of the rivets in cooling, is often sufficient to prevent any slip so long as the stress is no greater than that prevailing under ordinary working conditions. Thus the rivets may be entirely exempt from shearing stress, and the plates may be similarly protected from crushing, or crippling, pressure. Even if this state of things exists, the inference must not be drawn that the ultimate strength of a joint is in any way increased thereby. The extent to which friction is caused depends upon the nature of the material, the shape of the rivet, and the mode of rivetting. Widely varying statements are made by different writers as to the value of the co-efficient of friction (f) for iron and steel plates. As the result of experiments by Morin upon plane surfaces which had been some time in contact, it appears that (f)=0·19. Clark, in his work on the Britannia and Conway Tubular Bridges takes the value of (f) as 0·18. Others suggest that (f)=2·5, and Stoney states that in some experiments made by him upon ordinary steel plates pressing on each other, the co-efficient proved to as high as 0·6. This estimate is not representative of the value of (f) for clean and absolutely plane surfaces of the metal, and ought only to be accepted on the basis:—(f)=0·6 for (steel + inequalities + dirt). The contractile strength of hand-made iron rivets was stated in the last chapter as 12·32 tons per square inch, and the frictional resistance of steel plates held together by iron rivets cannot well be greater than 0·6 × 12·32 = 7·39 tons per square inch of rivet section. In order that this computation may be compared with ascertained results, we subjoin Table XXXIII., in which all records are expressed in uniform terms of tons per square inch of rivet area. From this table the following conclusions may apparently be drawn:—

(1) That the average frictional resistance of rivetted joints is about 8·8 tons per square inch, both for iron and for steel;

(2) That the ratio of hand to machine rivetting is as 1 : 2·4;

(3) That the ratio of single to double rivetting is as 1 : 1·9;

(4) That if the value of ¾ in. rivets per square inch of area = 1; then the values of ⅞ in., and 1 in. rivets are 0·8 and 0·75 respectively;

(5) That differently shaped rivet heads do not affect frictional resistance to a very serious degree.

Further experiments are needed for the complete establishment of a basis from which the friction of joints may be correctly calculated. In the meantime, it is probable that fairly accurate calculations may be made by the use of co-efficients obtained by slightly modifying the ratios mentioned above. Table XXXIV. has been calculated by taking the value of a ⅞ in. rivet at 5·6 tons per square inch, as derived from the experiments of Professor Kennedy (Table XXXIII.), and the following ratios have been adopted for different modes of treatment, viz.:—single-rivetting : double-rivetting as 1 : 1·3; hand-rivetting : machine-rivetting as 1 : 2; rivet diameter ¾ in. = 1·0, ⅞ in. = 0·8, 1 in. = 0·7.

For the purpose of comparison we append Table XXXV., which is based on one by Professor Kennedy; the only difference being that the values are stated in tons per square inch instead of in tons per rivet. With regard to all experimental data, it must be remarked that slipping of the plates is assumed to be visible, and Professor Kennedy suggests it is possible that the observed slip may consist almost wholly of shear. Friction is never taken into account when the proportions of a joint are being calculated, as it may disappear entirely in process of time owing to vibration and other causes.

Practical engineers are quite agreed upon the desirability of conforming as far as possible to the theoretical proportions of riveted joints, but it is neither practicable nor convenient for the correct standard to be approached when the plates exceed ⅝ in. in thickness. Theory provides for equality of resistance both in the plate and in the rivet. Every one is ready to admit that if, whilst possessing sufficient

Table XXXIII.—Friction of Rivetted Joints, as judged by Visible Slip, in Tons per Square Inch of Rivet Area.

Authority and Metal.	Diameter of Rivet.	Mode of Rivetting.		Form of Rivetting.		Shape of Rivet Head.		
		Hand.	Machine.	Single.	Double.	Snap.	Conical.	Countersunk.
Iron.								
Clark	¾ in.	—	—	—	9·3	—	—	—
Reed	⅞ in.	—	—	—	10·6	10·6	—	—
	,,	—	—	—	11·3	—	11·3	—
	,,	—	—	—	9·4	—	—	9·4
	1 in.	—	—	—	7·2	7·2	—	—
	,,	—	—	—	8·9	—	8·9	—
	,,	—	—	—	5·4	—	—	5·4
Average	—	—	—	—	8·8	8·9	10·1	7·4
Steel.								
Kennedy	¾ in.	5·6	—	5·6	—	—	—	—
	,,	7·2	—	—	7·2	—	—	—
	,,	—	15·9	—	15·9	—	—	—
Reed	,,	—	—	—	9·0	9·0	—	—
	,,	—	—	—	10·8	—	10·8	—
	,,	—	—	—	8·0	—	—	8·0
Wildish	,,	—	—	—	10·7	10·7	—	—
	,,	—	—	—	10·2	—	10·2	—
	,,	—	—	—	12·7	—	—	12·7
Kennedy	1 in.	4·0	—	4·0	—	—	—	—
	,,	5·4	—	—	5·4	—	—	—
	,,	—	11·4	—	11·4	—	—	—
Reed	,,	—	—	—	7·5	7·5	—	—
	,,	—	—	—	6·9	—	6·9	—
	,,	—	—	—	6·3	—	—	6·3
Wildish	,,	—	—	—	8·1	8·1	—	—
	,,	—	—	—	9·3	—	9·3	—
	,,	—	—	—	11·1	—	—	11·1
Average	—	5·5	13·6	4·8	9·4	8·8	9·3	9·5

Table XXXIV.—Calculated Slipping Load of Rivetted Joints, in Tons per Square Inch of Rivet Area.

Diameter of Rivet.	Single Rivetting.		Double Rivetting.	
	Hand.	Machine.	Hand.	Machine.
⅝ in.	5·6	11·2	7·28	14·56
¾ in.	4·48	8·96	5·82	11·64
1 in.	3·92	7·84	5·09	10·18

Table XXXV.—Approximate Loads at which a Rivetted Joint will Commence to Slip Visibly, in Tons per Square Inch of Rivet Area (Kennedy).

Diameter of Rivet.	Single Rivetting.		Double Rivetting.	
	Hand.	Machine.	Hand.	Machine.
⅝ in.	5·6	—	6·8 to 7·9	15·9
1 in.	4·0	—	5·4	10·1 to 12·7

Table XXXVI.—Boilermakers' Proportions for Rivetted Iron Joints (Wilson). (All measurements are in inches.)

Thickness of Plate.	Single Rivetted Lap Joints.		Double Rivetted Lap Joints and Butt Joints, with Single Cover Plate.		Double Rivetted Butt Joints with Double Cover Plate.		
	Rivet Dia.	Pitch.	Rivet Dia.	Pitch.	Rivet Dia.	Pitch.	Thickness of Cover.
⅜	⅝	1⅝	⅝	2⅜	—	—	—
7/16	⅝	1⅝	⅝	2⅜	⅝	2¼	⅜
½	¾	1¾	¾	2½	¾	2½	7/16
9/16	¾	2	¾	2½	¾	2¾	½
⅝	⅞	2⅛	⅞	2¾	⅞	3	9/16
¾	1	2¼	1	3⅛	1	3⅛	⅝
⅞	1	2⅜	1	3⅜	1	3⅜	¾
1	1⅛	2½	1⅛	3½	1⅛	4	⅞

Table XXXVII.—Boilermakers' Proportions for Rivetted Steel Joints (Board of Trade). (All measurements are in inches.)

Thickness of Plate.	Single Rivetted Lap Joint.			Double Rivetted Lap Joint.			Double Rivetted Butt Joint Two Cover Plates.		
	Rivet Dia.	Pitch.	Lap.	Rivet Dia.	Pitch.	Lap.	Rivet Dia.	Pitch.	Cover Plate.
⅜	⅝	1⅝	2 1/16	⅝	2 1/16	3⅛	—	—	—
7/16	1 1/16	2 1/16	3 1/16	¾	2⅛	4⅛	1 1/16	2 1/16	6⅞
½	1 1/16	2 1/16	3 1/16	1 1/16	3 1/16	5 1/16	1 1/16	3 1/16	8⅛
9/16	—	—	—	1⅛	3 1/16	6¼	1⅛	3 1/16	9⅜
⅝	—	—	—	—	—	—	1⅛	4 1/16	11⅛
1	—	—	—	—	—	—	1 1/16	4 1/16	12½

Table XXXVIII.—Shipbuilders' Proportions for Rivetted Iron Joints. (All measurements are in inches). Rivet pitch = 4 diameters.

Thickness of Plates.	Rivet Diameter.	Breadth of Lap.			Breadth and Thickness of Cover Plates.	
		Single Rivetting.	Double Rivetting.		Double Rivetting.	Triple Rivetting.
			Zig-zag	Chain.		
⅜	⅝	1⅝	2⅜	3	6¼ × ⅜	9¼ × 7/16
7/16	¾	2	3 1/16	3⅜	7½ × 7/16	11½ × ½
½	¾	2	4	4⅛	9 × ½	13¾ × 9/16
9/16	—	—	4 1/16	4½	9⅜ × 9/16	14⅜ × ⅝
⅝	—	—	4⅛	5⅛	10⅝ × ⅝	16 × ¾
¾	1	—	5 1/16	6	12½ × ¾	18¾ × 1
1	1⅛	—	6⅛	6⅞	—	20¼ × 1⅛

Table XXXIX.—Approximate Values of Iron and Steel Rivetted Joints, in Parts per Cent. of the Original Solid Plate.

Form of Joint.	Iron.	Steel.		
		Thickness of Plate.		
		¼ in. to ⅝ in.	⅝ in. to ¾ in.	¾ in. to ⅞ in.
Lap-joint, single rivetted, punched	45	50	45	40
,, ,, ,, drilled	50	55	50	45
,, double ,, punched	60	75	70	65
,, ,, ,, drilled		80	75	70
Butt-joint, one cover, single rivetted	45	—	—	—
,, ,, ,, double ,,	60	—	—	—
,, two covers, single rivetted	55	—	—	—
,, ,, ,, double ,, punched	66	75	70	63
,, ,, ,, ,, ,, drilled		80	75	70

strength for their work, the rivets fail more readily than the plates, plate material must be wasted; and, conversely, that if the plates fail more readily than the rivets, a waste of rivet material must be involved. But no one has succeeded, or is likely to succeed, in making practice invariably coincide with theory. Taking rivets, for instance, we find by Rule I., Chapter II, that with 1 in. plate, the theoretical diameter of the rivet should be 2 in. for iron, and 2·3 in. for steel, in a single riveted lap joint. A rivet of this diameter would be much too large for manipulation, unless by the aid of exceptionally powerful machinery. In boiler-making shops rivets are seldom used of more than 1⅛ in. or 1¼ in. diameter, and in structural work there is a very obvious objection to the employment of unnecessarily large rivets. Looking at the theoretical pitch of the same joint, we find by Rule III., Chapter II, that the rivets should be spaced 5·3 in. and 5·36 in., centre to centre, for iron and steel respectively. Neither of these pitches would be inappropriate for girder work, but the boiler-maker would object to them most strongly because of the impossibility of making steam-tight joints with the rivets so far apart. Therefore, in using thick plates it is undesirable to conform with theoretical rules. So far as boiler-making is concerned, the practice is to adopt the widest pitch consistent with tightness, to use rivets of the greatest possible diameter, and to proportion the strength of the shell plates to the weaker element of the joint, whether it be represented by the rivet or the plate. Again, when single and double rivetting both occur in the same boiler, one diameter is adopted for all the rivets, and once more theory is upset.

Similarly, in joints for structural work theory often takes a back place. The pitch of the rivets may be decided with the especial object of avoiding undue reduction in the strength of the plates by numerous transverse perforations, and reasons of a practical nature may fix ¾ in. as the rivet diameter. Assuming these conditions, a sufficient number of rivets must be put in to withstand the stress coming upon the joint, and their arrangement will necessarily be governed by the available width of the plates. Several rows of rivets may therefore be required, and the number of rows (n) may be determined by the following rule:—

$$n = \frac{(t-d)t}{\cdot 7854\ d^2}.$$

A joint of this kind may very easily constitute a violation of theory, but it should be judged more by the criterion of suitability for the duty required than by abstract principles. Special requirements are evidenced, again, in connexion with ship-building, and in this industry the practical proportions of rivetted joints differ from those adopted in boiler-making and in structural work. Hence we find that various standards have grown up, each being suited for its particular purpose, and only conforming to theory so far as may be convenient. The following Tables give some of the proportions for rivetted joints used by boilermakers and shipbuilders.

Rivets used in girder work may be of the sizes adopted by boiler-makers, but ¾ inch rivets are more largely employed than any others. As joints in structural iron-work have not to be caulked, the distance of rivets from centre to centre may be from 3 to 6 inches, but it should not exceed six diameters of the rivet, or about ten times the thickness of the plate, otherwise moisture will be apt to penetrate between the plates, causing rust, which may ultimately damage the joint.

Thus, the maximum spacing for rivets of ordinary sizes should be:—½ in. (dia.), (p) = 3 in; ⅝ in. (dia.), (p) = 3¾ in.; ¾ in. (dia.), (p) = 4½ in.; ⅞ in. (dia.), (p.) = 5¼ in.; 1 in. (dia.), (p.) = 6 in. In builders' ironwork these pitches are frequently exceeded, possibly with a view to economy, but the practice should always be discouraged. Very often it will be necessary that the pitch should be very much less than the maximum spacing mentioned above. Single-rivetted joints are weakened by unequal tension, which produces a loss of efficiency estimated at about 20 per cent. of the net section. Double-rivetted joints are therefore in every way to be recommended, and they may be either chain-rivetted, as fig. 63, or zig-zag-rivetted, as fig. 64 (Chapter II). In the former style of rivetting the distance between the two rows of rivets is generally two diameters of the rivet; but if the holes are punched, it is safer to make the distance equa to 2½ diameters.

to allow for the zones of weakness caused by this method of perforation. Fracture in zig-zag-rivetted joints often takes place as shown in fig. 80 (Chapter 11), and the stress along this zig-zag line is composed of tensile and shearing stress. Professor Kennedy states that in order to ensure a straight fracture the net metal measured zig-zag should be from 30 to 35 per cent. in excess of that measured straight across. Consequently the diagonal pitch becomes $\frac{2}{3}p + \frac{d}{3}$, where p=the straight pitch and d=diameter of the rivet hole. When setting out a double-rivetted zig-zag joint, the best course is to settle the ordinary pitch, and then to determine from it the distance between the rows of rivets.

We have seen that the bending of a joint causes injury owing to the establishment of unequal stress, and as experience shows that a similar result follows the bending of a single-rivetted butt-joint with one cover-plate, an advantage is gained by making the cover somewhat thicker than the plates connected thereby. Professor Unwin recommends that single cover-plates should be 1¼ times the thickness of the plate, and the Board of Trade rules state that single butt-straps with punched holes must be one-eighth thicker than the plates they cover. When two cover-plates are fitted, no necessity exists for additional strength, and the covers need not be more than five-eighths or two-thirds the thickness of the plates covered. Care always has to be taken to leave a sufficient margin outside the rivets of any joint, otherwise the plate might burst as shown in fig. 78 (Chapter 11). Ample safety is ensured by making the margin equal to the rivet diameter, except in butt-joints with double covers, and in joints where the plate edges are roughly trimmed, and the holes are punched. In such cases as these the margin should be equal to at least 1¼ times the rivet diameter. The extent to which one plate should overlap another, or to which two plates should be covered by butt-straps, is governed partly by the margin necessary, partly by the number of rows of rivets, and partly by the distances necessary between the rows. As narrow bars offer less resistance to splitting action than plates, the lap may advantageously be increased to 1½ diameters of the rivet.

Finally, we have to inquire into the practical efficiency of rivetted joints as compared with the original plate. Some fifty or sixty years ago there was a popular superstition to the effect that rivetted joints were actually stronger than the solid plate. No person of average intelligence would venture to express such an opinion in the present day, but very likely there are many who do not fully recognise the serious diminution of strength which must take place if a plate is cut, and the two pieces are then joined by rivetting. The theoretical percentage of strength, judged by the resistance of the net plate section cannot be more than $\frac{p-d}{p} \times 100$. When determined by the shearing resistance of the rivet, the theoretical percentage must depend upon the effective shearing area, considered in connexion with the section of the original plate. Denoting these values as before, we find that the theoretical percentage = $\frac{7854d^2}{p \times t} \times 100$. If exact theoretical proportions be taken, so that the stresses tending to tear the plate and to shear the rivet are exactly balanced, the total theoretical efficiency of the joint will be a little less than 61 per cent. But proportions such as these are not always observed, and the example of a steel joint taken, on p. 297, is probably as near an approach to theory as one is likely to meet with in ordinary architectural practice. Calculating the theoretical percentage by the rules given above, and taking the value of p as the width of the plate, we get the following results :—

$$\frac{p-d}{p} \times 100 = \frac{3-1}{3} \times 100 = 66{\cdot}6 \text{ per cent.}$$

$$\frac{7854d^2}{p \times t} \times 100 = \frac{{\cdot}7854}{1{\cdot}5} \times 100 = 52{\cdot}36 \text{ ,, ,,}$$

Here the rivet is by far the weaker part of the joint, and the greater strength of the plate does not make the joint any stronger. The next point is that a large deduction must be made from theoretical efficiency to cover loss of strength due to the various causes to which attention has already been fully directed. Turning back to Examples 1 and 2, p. 297, we find the rivet strength of this joint to be 17·27 tons, and the plate strength 30 tons. The strength of the original plate per square inch is assumed to be 28 tons, 2 tons having been added in Table XXVII, to represent increase of strength due to drilling. Therefore the total strength of the original plate section was (3 in. × ·5 in.) × 28 = 42 tons, and the efficiency of the plate in the joint is (30 ÷ 42) = 71 per cent., which is higher than the previous result of 66·6 per cent., because no allowance was then made for increase of tenacity owing to drilling. This high efficiency of the plate largely represents waste material. To find the actual efficiency of the joint we must see what relation the rivet strength bears to the strength of the original plate, thus: 17·27 ÷ 42 = 38 per cent. If the same kind of joint were made in iron, the figures would be as follows :—Strength of plate in joint = 18 × ·5 (1 + 1) = 18 tons ; strength of original plate (3 in. × ·5 in.) × 22 tons = 33 tons ; efficiency of plate in the joint = 18 ÷ 33 = 54 per cent., shearing strength of rivet = ·7854 × 19 = 14·9 tons ; efficiency of joint = 14·9 ÷ 33 = 45 per cent. By these figures we see that the iron joint would have a higher percentage of efficiency, though it would actually be weaker than, and cost quite as much as, a steel joint. Table XXXIX. contains the approximated values of iron and steel joints as compared with the solid plate. The figures are derived from the experiments which have been quoted and from other sources, but it should be remarked that in order to make a safe estimate of the efficiency of joints such as are used in structural work, fully 15 per cent. ought to be deducted from the percentages stated in the table.

OBITUARY.

MR. ROGERS FIELD.—This distinguished hydraulic and drainage engineer, who died at his residence, Squires Mount, Hampstead, on March 28 last, was born in 1831. Mr. Field was named after his mother's uncle, Samuel Rogers, the poet. On his father's side, Mr. Rogers Field was descended from Henry Cromwell, his great grandfather, the founder of the old Annuity Society of London, having married Henry Cromwell's great granddaughter, Anne. His father was the well-known solicitor, Mr. Edwin Wilkins Field, whose statue is a prominent object in the hall of the Law Courts. Mr. Rogers Field was his eldest son, and never married. He was articled to Mr. Thomas Wicksteed, the eminent water engineer, and commenced practice some thirty years ago. He was the inventor of Field's engineering aneroid barometer, the special feature of which is an adjustment for variation in temperature, enabling altitudes to be correctly ascertained in an extremely simple manner. But he devoted himself more especially to engineering works connected with sanitation, and designed and superintended the construction of the drainage and water supply arrangements of a great number of public institutions and private buildings in all parts of the country, including the drainage of Sandringham House and Bagshot Park. The by-laws and regulations he framed in 1876 for the town of Uppingham were substantially adopted by the Local Government Board in 1877 in their model by-laws as to house drainage. The automatic flushing tanks and siphons which he brought, after many laborious experiments, to a high degree of perfection, are largely used in drainage and sewerage works both in this country and in America. Mr. Field was connected with the Sanitary Institute from its commencement twenty-four years ago, and was one of the most active members of its council and various committees. Moreover, he introduced thoroughly practical methods of judging at the exhibitions held at the annual congresses of the Institute. Through his generosity the Parkes Museum was entirely re-arranged and a catalogue of its contents issued. He was recently elected a vice-president of the Institute. His remains were interred at Highgate Cemetery on Saturday, March 31.

GENERAL BUILDING NEWS.

ST. JOSEPH'S CHURCH, MONAGHAN.—The new Church of St. Joseph, Monaghan, was dedicated on the 18th ult. The base of the building is of limestone, and the upper portion is of stone from the Glebe quarries, the facings being of stone from Dungannon and Knockatallon. A tower is situate at the south of the west gable. The interior of the building has a floor space of 120 ft. by 35 ft., and the height from floor to apex of roof is 50 ft. The chancel is 35 ft. by 18 ft. 6 in. The altars are all of marble, and were the work of Mr. E. Sharp, of Dublin. The following were some of the contractors :—Mr. M'Adorey, Dundalk, the roofing and ceiling ; Mr. Wynne, Dundalk, the gallery, doors, &c. ; Mr. Francis Duffy, Monaghan, the plastering, and Mr. Patrick Duffy, the painting. The gas-fitting and sanitary work were carried out by Mr. Samuel Benson, of Monaghan. The plans were by the late Mr. Hague and the building has been erected under the supervision of Mr. John Doran.

ADDITIONS TO CHURCH, TOXTETH, LIVERPOOL.—A new chancel, an organ chamber, and choir and clergy vestries have just been opened at St. James's Church, Toxteth. The chancel is 32 ft. by 20 ft. The walls are lined with Ruabon bricks, and the ceiling is of polished pitch-pine. An oak pulpit, by Messrs. Jones & Willis, and a lectern by Messrs. Norbury & Co. have been added. The architect was Mr. J. H. Havelock Sutton, of Liverpool, and the builder was Mr. Wm. Wood, of Liverpool.

ABERDEEN BOARD SCHOOLS—FURTHER EXTENSIONS.—The School Buildings Committee recommend the adoption of a plan by Mr. Ogg Allan, the Board's architect, for the remodelling of Woodside Public School, providing for its enlargement to a three-class school, at an estimated cost of 13,000*l*. The same architect's plan for enlarging the Girls' High School by the addition of gymnasium, cookery-room, cloak-rooms, &c., at a cost of 5,350*l*., has also been approved. The electric light is to be introduced into Mile-end School.

NEW BATHS FOR ST. PANCRAS.—Mr. W. O. E. Meade-King opened an inquiry at the Vestry-hall, Pancras-road, on the 27th ult., at the instance of the Local Government Board, respecting the application of the parish of St. Pancras to borrow 70,000*l*. for the purpose of erecting public baths and wash-houses in the Prince of Wales's-road, Kentish Town. The plans of the proposed baths, designed by Mr. Thomas W. Aldwinckle, provide for four swimming baths—two for men and two for women—for fifty washing compartments for clothing, &c., and 130 private baths. The men's swimming baths are to be 100 ft. by 35 ft., and one of them will be used in the winter as a public hall.

TOWN HALL, ILFORD.—The foundation stone of this building has just been laid by Councillor W. W. Gilson, J.P. At the ceremony Mr. Ben Woollard, the architect, in giving details of the building, said the buildings had been so planned that the Town Hall can be entirely shut off from the offices if occasion should require, and two main entrances are provided. The Town Hall portion comprises a large hall 76 ft. long by 57 ft. wide, with a stage 33 ft. wide by 18 ft. deep, with two retiring-rooms on the same level as the stage and three large rooms under. On either side of the entrance vestibule are arranged cloak-rooms, and over these is a gallery 35 ft. wide by 17 ft. deep. The seating accommodation is estimated up to 1,000. The stage has been raised 5 ft. above the floor so as to give a view from all parts of the building when used for theatricals. Four doors at either end and one in the middle (nine in all) have been provided to the main hall, and two to the gallery, those from the gallery going directly into the street. In the office portion, provision is made on the ground floor for the rates collector, surveyor, sanitary inspector, medical officer, and foreman in connexion with the surveyor and inspector, and other rooms. Also two fire-proof strong rooms, one for the town archives and the other for the contract plans. On the upper floor of the clerks' offices, committee-rooms, and a Council Chamber, 40 ft. by 30 ft. and 25 ft. high. There will be a staircase leading up to this floor, and a second staircase at the rear of the Council Chamber. Rooms for the caretaker are provided on the floor over this, and a basement under a portion of the back part of the buildings. A lift will be arranged from the basement to the top floor communicating with each floor. The Town Hall will be lighted in the daytime by large skylights and ornamental lights in the ceiling. The ceiling will be elliptical in form, and at the highest point 36 ft. from the floor. Provision will be made for both gas and electric lighting by night. The heating of the various rooms will be by open fires, but the Town Hall, staircase hall, and corridors will be heated by low pressure steam radiators. The material to be used for the facing of the two façades is Monk's Park stone, and this will be coated with Fluate. The style is "free Classic." The cupolas at the corners and the dome of the central pavilion will be covered with copper. The height of the building will be 43 ft. to the top of the balustrading from the pavement, and to the very highest point of the building will be 80 ft. from the pavement. The frontage to the High-road will be 115 ft., and to Oakfield-road 102 ft. The contract price is 24,900*l*., and the work is being carried out by Mr. George Sharpe.

HOSPITAL, NORTH BERWICK.—A new hospital for infectious diseases, North Berwick, was opened on the 29th ult. The building has been erected at a cost of 2,563*l*. It is situated in the New-house-road, and is designed for sixteen beds in two-ward blocks. Meantime, however, only one-ward block, having two wards with four beds in each, with the administrative block and ward offices, have been erected. The principal building is the ward block, which also contains the nurse's duty-room, proper provisions for bathing, two sanitary towers, cut-off passages, and fittings. In the centre of the block there are two convalescent rooms. The architect of the new building is Mr. G. Morham, Edinburgh.

GASWORKS, CROMER.—New gasworks for the Cromer Gas Company were opened on the 29th ult. The new works are situated near the Midland and Great Northern Joint Railway, about half a mile

west of Cromer Beach station. The retort house contains four arches of Chester's patent regenerative settings, with six retorts in each. The gasholder, 60 ft. in diameter and 40 ft. deep, was constructed by Messrs. S. Cutler & Sons. The engineer was Mr. Percy Griffith; and the contractors were Messrs. E. Dempster & Sons, Limited, of Elland.

MISSION HALL, PAISLEY. N.B.—The memorial stone of a mission hall in Canal-street, Paisley, was laid on the 31st ult. The hall will accommodate 300 persons. The architect is Mr. John Robb, of Glasgow.

PAROCHIAL HALL, ST. JUDE'S, DUBLIN.—The new Parochial Hall in connexion with St. Jude's Parish, Dublin, was opened on the 24th ult. The architect of the building was Mr. Hampden Shaw, of Dublin, and Messrs. Kennan & Sons were the contractors.

GOLF CLUB-HOUSE, LEVEN, FIFE.—A new club-house for the Leven Thistle Golf Club was opened on the 30th ult. The architects were Messsr. A. & A. C. Dewar, of Leven. The building has cost 1,700*l.*

ABBEY CHURCH, LOUGHREA, IRELAND.—The Abbey Church at Loughrea has just been reopened after enlargements. The additions to the church, which make it practically a new structure, consist of new sanctuary, side chapels, transepts, and porch. The transepts are divided from the nave by moulded arches resting on carved floriated caps with polished granite columns and moulded bases. The chapels are also divided from sanctuary and transepts by similar arches, columns, &c. The sanctuary, which terminates in a semi-circular apse, is 29 ft. in length by 23 ft. 6 in. in width, and is lighted by five lancet windows. The sanctuary arch, which is deeply moulded, is supported on polished marble shafts with carved and moulded caps and bases. The transepts are each 25 ft. by 18 ft., and lighted by large sexafoil windows. A tower, 19 ft. square, is erected on the north side of sanctuary. It rises to a height of 73 ft., and is surmounted by an embattled parapet and arcaded cornice. The tower is four stages in height, the lowest forming a porch and lighted by quatrefoil windows. The lantern or bell stage is lighted on each side by double-light windows having jamb-shafts, and moulded and carved caps and bases, and deeply-moulded arches and labels over. The side chapels, which are each 15 ft. by 12 ft. 6 in., are lighted by circular sexafoil foliated windows. The height from sanctuary floor to ceiling is 31 ft., from nave floor to ceiling 24 ft., and from transept floor to ceiling 32 ft. The dressings of doors, windows, &c., throughout are of limestone; the timber work of ceilings, &c., of pitch pine. The church is Romanesque in style, and the work has been carried out by Mr. Thomas Sweeny, builder, of Loughrea, from the plans and specification and under the superintendence of Mr. William H. Byrne, architect, of Dublin.

POLICE BUILDINGS, NEWTON-LE-WILLOWS, LANCASHIRE.—The new police-court buildings for Newton-le-Willows, which have been in course of erection since August, 1898, are approaching completion. The buildings are to cover 1,275 yards, about two-thirds of which represent the area allotted for main buildings, and the remainder for a yard and an outbuilding, which will be used as a weights and measures office for the township of Newton-le-Willows. The windows of the court-room are of stained glass, and in the centre of each is the county coat-of-arms. The wood used throughout is satin walnut. Hot-water coils and pipes heat the room, as also all the other large rooms. The magistrates' consulting-room, which will also be used as an extra court-room when necessary, is in the rear of the magistrates' bench. The public entrance to the court is on the north of the building, and adjoining this is a staircase leading to three double cells, the dimensions of which are 14 ft. by 7 ft. Residences are provided for the sergeant and a constable on the north and south of the buildings, and the charge office lies between these houses. The bricks used in the building are of Accrington make, and the stone facings are from Collingworth, Yorkshire. The contractor is Mr. John Dickinson, of Westhoughton, Bolton; and the architect Mr. Henry Littler, Preston. The cost of the buildings will be between 5,000*l.* and 6,000*l.*

CO-OPERATIVE PREMISES, CONSETT, DURHAM.—On the 10th ult. a block of buildings erected as business premises by the Consett Provident and Industrial Society, Limited, were opened. The new premises have been erected on the site of the old buildings destroyed by fire. The total cost is about 10,000*l.* The building is three stories high, with extensive cellarage, in which are placed a strong-room and meter-room, the various floors being connected by a hydraulic lift. The ground floor contains two shops, with separate entrances from Newmarket-street. Running at right angles from these departments is a cartway entrance, and on the opposite side are packing warehouses. The entrance to the second floor is by Gibson-street. The second floor is utilised as a grocery and flour warehouse, and furniture store and show-rooms. On the third floor are the secretary's offices and reading and recreation rooms, a dining-room for the employés of the stores, general and male clerks' offices, a waiting-room for the public, and female clerks' offices. There are also club rooms, library, reading-room, and committee-rooms. The designs were prepared by Messrs. Liddle & Browne, architects, Newcastle; and the whole details of the work have been carried out under the supervision of Mr. G. R. T. Broadway, of Alnwick. The contractor is Mr. J. G. Bradley, of Durham and Consett.

THEATRE, STOKE, STAFFORDSHIRE.—A new theatre has been erected at Stoke. The Gordon Theatre—such is the name bestowed on the new building—has a façade of 160 ft. to Wolfe-street, constructed of red Accrington bricks, with terra-cotta facings. The principal block is surmounted by two terra-cotta cupolas, the central feature being a gilded allegorical figure representing Liberty. There is also a bust of General Gordon fixed in panels over the central entrance. An iron and glass shelter runs along the whole length of the building. The architect is Mr. G. F. Ward, of Birmingham. The building is fireproof in construction, and a fire-proof curtain has been supplied to the proscenium opening. The stage is 60 ft. by 40 ft. The electric light installation is by Messrs. Ludlow & Knight, of Birmingham; the heating is by Mr. Peake, of Fenton; the contractor for the whole work being Mr. T. Godwin, of Hanley. The seating accommodation is for about 2,000, and there is additional room in the promenade for 300 or 400 people. The auditorium comprises stalls, pit stalls, pit, dress circle with family circle or balcony at the back, and amphitheatre with gallery at the rear, there being two large tiers. A feature will be the addition of a winter garden, approached from the dress circle.

ABATTOIR AND MARKET SCHEME, LINCOLN.—A Local Government Board inquiry was held at the Guildhall, Lincoln, recently, by Colonel A. C. Smith, R.E., into an application by the Corporation for sanction to the following loans:—5,500*l.* for the purchase of land in Butchery-street, as a site for a covered market; 2,497*l.* for additions to the Cattle Market; and 6,400*l.* for the erection of public abattoirs on land adjoining the Cattle Market. Mr. R. A. MacBriar, the City Surveyor, submitted plans of the abattoirs.

SANITARY AND ENGINEERING NEWS.

WATERWORKS, ARBROATH, FORFAR.—The new waterworks at Nolt Loan, in connexion with the augmentation of the water supply of Arbroath, are now practically completed. The engineer is Mr. M'Culloch, of Edinburgh. The works have cost about 8,000*l.*

SEWERAGE SCHEME, LEEDS.—The Sewerage Committee of the Leeds Corporation have provisionally approved of a scheme for the acquisition of a new site for the treatment of Leeds sewage. It is proposed to purchase the Gateforth Hall Estate of 1,882 acres for 85,000*l.* The estate is situated in the lower valley of the Aire, about five miles east of Selby, and 14 miles from the present works at Knostrop. Five years ago the City Engineer, Mr. T. Hewson, prepared plans and made surveys for conveying the sewage of Leeds to this site, and for over two years, it is stated, experiments in the biological treatment of sewage have been carried on at Knostrop.

THE BACTERIAL TREATMENT OF SEWAGE.—Alderman Sir Bosdin T. Leech, Chairman of the Rivers Committee of the Manchester Corporation, has issued copies of correspondence which has taken place between various writers in Manchester and officials in America as to the alleged trial and failure of the bacterial treatment of sewage in the State of Massachusetts. Sir Bosdin leaves the correspondence to speak for itself, but in an introductory note he says: "Manchester sewage will, in the end, however, have to be treated on its merits, and experience elsewhere may be useful, but cannot determine the exact method of treatment to be adopted in Manchester."

SEWERAGE SCHEME, YEOVIL.—Mr. F. H. Tulloch, M.Inst.C.E., held an inquiry at the Town-hall, Yeovil, on the 30th ult., on behalf of the Local Government Board, into the application of the Yeovil Town Council to borrow 24,000*l.* for purposes of sewerage and sewage disposal, including the construction of the works in Yeovil Without. Mr. Armytage, the Borough Surveyor, described the plans he had prepared. The new works will include the erection of an intercepting chamber and a pumping station, and there will be five tanks and 10,670 square yards of filters in two beds of twelve filters each.

INSTITUTE OF SANITARY ENGINEERS.—At an examination in Practical Sanitary Science, held on March 23 and 24, the following passed, qualifying for "membership," viz., C. B. Burnett, Camberley, Surrey; J. Haworth, Ramsbottom; and the following qualifying for "associateship," viz., E. Lumley, London.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held in Birmingham on March 23 and 24, three candidates presented themselves. One of these, Mr. Edward Camm, was granted a certificate in Practical Sanitary Science.

BOARD OF EDUCATION.—We are asked to mention that from this date all communications relating to elementary education should be addressed to the Secretary, Board of Education, Whitehall, London, S.W. Letters concerning science, art, and technical education should be addressed to the Secretary, Board of Education, South Kensington, London, S.W

STAINED GLASS AND DECORATION.

WINDOWS, AYLMERTON CHURCH, CROMER.—A stained-glass window has just been erected in this church in memory of the late Miss Marion Kettle, of Felbrigge. The window consists of three lights and tracery, and contains subjects of the Three Maries at the Tomb, Our Lord appearing to Mary in the Garden, and the Ascension. The work has been executed by Messrs. Powell Bros., of Leeds.

MEMORIAL WINDOW, KINGSLEY CHURCH, STAFFORDSHIRE.—A stained glass memorial window has just been erected in the parish church of St. Werburgh's, Kingsley, by Messrs. Ward & Sons, of Uttoxeter. The window was made by Messrs. Morris & Son, of London.

MEMORIAL WINDOW, PARISH CHURCH, ATTLEBOROUGH, NORFOLK.—A stained-glass window, in memory of the late rector, has been placed in the south aisle of Attleborough parish church. The window is of three lights, and was made by Messrs. King & Co., of Norwich.

WINDOWS, PARISH CHURCH, MAYBOLE, AYRSHIRE.—Four stained-glass windows, the work of Messrs. Stephen Adam & Son, of Glasgow, have been placed in the front gable of this church.

WINDOW, ST. PAUL'S CATHEDRAL.—The window in the north-end transept of St. Paul's Cathedral, presented by the late Duke of Westminster, has just been unveiled. It is a companion window to that in the south-end transept previously given by the Duke. Like that window, it is the work of Sir W. B. Richmond, R.A. In the older window are representations of the kings of the Saxon Heptarchy, whilst the new one gives the archbishops and bishops, including Theodore, Archbishop of Canterbury. The new window cost 3,000*l.* A window given by Lady Carnarvon was also unveiled. It is situated in the east end of the north-choir aisle.

FOREIGN.

FRANCE.—The Council-General of the Seine has opened a competition among painters for the decoration of the new Mairie at Asnières. The designs are not to be sent in till December, when they will be exhibited at the Hôtel de Ville of Paris.——MM. Bourdelle and Desbois, sculptors, have started an atelier at Montparnasse, which is to be under the direction of M. Rodin, and to be called the "Atelier Rodin."——The official architect of the Department of the Rhône has prepared the plans for a great custom-house depôt to be built at Marseilles, at an estimated cost of near four million francs——The Government propose to construct a new quay on the left bank of the Loire, at Nantes, at an estimated cost of about 1,600,000 francs.——The jury in the competition for a savings bank to be built at Bar-sur-Seine have awarded the first premium to M. Royer, architect, of Bar-sur-Seine; and the second to M. Belloy, of Troyes.——The French Government is proposing to spend a million francs on the improvement on the port of Philippeville, in Algeria.

ITALY.—It is stated that the project of a new façade to Milan Cathedral is likely to fall to the ground, in spite of its having been the subject of a great competition. The chapter of the cathedral now feels itself ready to carry out the work, and they have announced their intention to begin the execution of Brentano's design. They had not reckoned with the citizens of Milan, however, for, now that these latter see an immediate prospect of the façade being erected, the project is meeting with very strong opposition from them, which, it is feared, may have the effect of causing it to be abandoned. The cathedral authorities must immediately move in the matter, or lose the bequest under which they would be able to carry out the greater part of the work.

EGYPT.—It is believed that before the end of the present season two-thirds of the main wall of the Nile dams at Assouan will be completed. The masonry of the navigation canal has already been commenced.

MISCELLANEOUS.

GOOD FRIDAY WEEK.—In consequence of the Easter Holidays, next week we go to press a day earlier than usual. All communications for the Editor must reach him by *first post on Wednesday morning*, except lists of tenders, which will be received up to 10 a.m. of the same day.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.—The adjourned general meeting for the discussion of the subject of ancient lights will be held on Monday next. Notice has been given by Mr. C. H. Brodie, one of the hon. secretaries of the Practice Standing Committee, that he will move the following resolution on behalf of the Committee: "That this meeting considers an alteration in the law of ancient lights to be urgently needed, and requests the Council to put itself into communication with the Council of the Surveyors' Institution without delay, with a view to the co-operation of that body in taking such steps as may be necessary to secure an amendment."

THE SURVEYORS' INSTITUTION.—The country meeting of the Surveyors' Institution this year will be held, by permission of the Lord Mayor and Corpora-

tion of Leeds, in the Council Chamber of the Town Hall, Leeds, on Wednesday, April 25, at 11 a.m., when the following papers will be read and discussed:—(1) "Leeds, its Past and Present," by Mr. John Hepper; (2) "Nuisances and Noxious Trades," by Mr. Arnold Statham; (3) "Covered Sheds for Farm-yard Purposes," by Mr. A. T. Walmisley; (4) Adjourned discussion on the paper read by Mr. J. H. Sabin (Professional Associate), at the last ordinary meeting, entitled "The Incidence of Imperial and Local Taxation on Rateable Property." The members will dine together at the Hôtel Métropole, King-street, Leeds, on the evening of April 25, at 6.30 for 7 p.m. The following day will be devoted to excursions to (1) places of interest in Leeds and its vicinity (2) Bramham Park and Temple Newsam (3) York (4) Sheffield.

WATERLOO-ROAD.—Under a scheme for building new premises on the ground between Francis-street and York-street, as many as 350 persons will be dispossessed. The project, which has been formally sanctioned by the Lambeth Vestry, provides for the erection of shops, a hotel, and sets of residential chambers, and involves the stopping up of Anne-street and Agnes-street.

HULL ARCHITECTS AND THE QUESTION OF FLUSH.—A meeting of the Hull Corporation Waterworks and Gas Committee was held at the Town Hall on the 26th ult., Alderman Massey, presiding. A deputation, consisting of Mr. F. S. Brodrick, Mr. B. S. Jacobs, and Mr. J. Bilson, waited upon the committee to lay before them the objections of the architects of the city to two of the proposed new by-laws for preventing waste, misuse, and undue consumption or contamination of water. The first objection taken was to By-law 3, and the deputation submitted that the weights of hot-water circulating pipes required were excessive. The Chairman said that the by-laws, as originally drafted, contained weights in agreement with those suggested by the deputation, but the Local Government Board altered them to make them comply with their model by-laws. Of course, the committee had a certain licence given to them, and they would not do anything to harass trade. The Mayor remarked that it did seem an absurd thing to have pipes (where there was no pressure of the same strength as those which had to withstand the waterworks pressure. The deputation's next objection was to By-law 21, Sub-section *a* of which limits the capacity of flushing cisterns to water-closets to a minimum of two gallons and a maximum of two and a-half gallons. They considered that that regulation was open to the strongest objection on sanitary grounds, and that its adoption would be a retrograde step in a matter closely affecting the health of the community. They urged in the strongest possible manner that, at the least, the maximum flush should be increased to three gallons. They pointed out that a two-gallon flush would probably never have been legalised by an Act of Parliament for London (Metropolis Water Act of 1871), if it had not been for the monopoly exercised by the London Water Companies, which are commercial undertakings with no concern for the sanitary aspects of the question, and every concern for paying large dividends to their shareholders. The Corporation of Hull was in a different position. It was the sanitary authority of the city, as well as the waterworks authority, and they submitted that it ought not to take a step which was almost unanimously condemned by experts on sanitary questions. The Chairman said that flush cisterns of the size proposed had been adopted in Sheffield, Birmingham, Birkenhead, Leeds, and other large towns. The Local Government Board had held an inquiry into the matter, and after hearing forty-two witnesses from various parts of the country the Inspector said that he failed to see the inefficiency of the two-gallon flush. The Mayor favoured the three-gallon flush. It was not in their own interests that the architects were dealing with the matter; they were simply experts giving the strong advice that two gallons were not sufficient. The deputation having thanked the committee and retired, it was resolved to request the Engineer to submit a report on the matter. The Engineer remarked that he was glad the architects and plumbers were looking into the last-named matter. They had had an unrestricted sway in Hull for twenty years, with the result that the consumption of water was one of the heaviest in the country.

CARTWRIGHT MEMORIAL HALL, BRADFORD.—On the 26th ult. Lord Masham paid a further visit to Bradford for the purpose of conferring with the Cartwright Memorial Hall Committee upon the designs for the building which is to be erected in Lister Park as a memorial to Dr. Cartwright, the inventor of the power loom. The result of the interview which the City Surveyor (Mr. Cox) had had with the architects of the accepted designs (Messrs. Simpson & Allen, of London) was reported, and it was explained to his lordship that the architects stated that it would be possible to "tone down" the building and thus effect economy in that way, but they did not at all recommend such a course. A perspective drawing of the new hall, which has been prepared, was also inspected, and ultimately Lord Masham expressed his approval of the committee's proceeding with the erection of the hall according to the original designs, which it is estimated will cost about 55,000*l*. Lord Masham intimated that he would carry out his recent promise, and contribute a half of the sum of 15,000*l*. which would be necessary beyond his previous gift of 40,000*l*., the other half to be provided by the Corporation. Previous to the visit of Lord Masham a meeting of the Finance and General Purposes Committee, of which every member of the Council is a member, was held, at which it was resolved that the City Council should be recommended to bear the remaining balance of the expense of the carrying-out of the designs.

LONDON GEOLOGICAL FIELD CLASS.—The Saturday afternoon excursions of the London Geological Field Class, under the direction of Professor H. G. Seeley, F.R.S., will commence on April 28. The excursions this year illustrate the geological structure of the London basin by devoting a day to examination of each of the cretaceous groups of rock, which share in the great trough-shaped fold which depresses the overlying tertiary strata. The stratification will be seen at Godalming, Otford, Gomshall, Oxted, and Upnor. One excursion to Bedford will be made in illustration of the oolitic rock, which has been found beneath London in some deep borings. The surface aspect of the different rocks, as influencing the geographical condition of the country, will be examined in the plateau and valley scenery between Richmond and Wimbledon, Weybridge and St. George's Hill, and between Ranmore Common and Leatherhead. A visit will be made also to the escarpment of the Addington Hills. Further particulars can be obtained from the hon. general secretary, Mr. R. Herbert Bentley, 43, Gloucester-road, Brownswood Park, South Hornsey, N.

NORWICH MASTER BUILDERS' ANNUAL DINNER.—The annual dinner of the Norwich and District Master Builders' Association was held on the 28th ult. at the Royal Hotel, when about seventy members and friends were present. The President, Mr. G. E. Hawes, occupied the chair, and among those present were the Mayor (Mr. J. Clabburn), the Sheriff (Mr. S. Wainwright), Lieut.-Colonel Hill, Alderman Cunnell, Alderman King, Councillor W. T. Scarles, Mr. A. E. Collins (City Engineer), Messrs. J. B. Pearce, E. T. Boardman, E. Buckingham, and J. H. Hatch (secretary). The Chairman gave the toast of "The Queen," and Mr. W. T. Scarles proposed the toast of "The Army, Navy, and Auxiliary Forces," and Lieut.-Colonel Hill responded. The President then gave the toast, "Prosperity to the City of Norwich," the Mayor responding. Mr. J. S. Smith gave "The Health of the Architects of Norwich and of the City Engineer," and spoke of the good feeling that existed between architects and builders in the city. Norwich had been very much improved in recent years by the Norwich architects and builders, and he hoped before long it would be still further improved by the erection of a suitable Town Hall near to the Guildhall. Mr. E. T. Boardman, in responding, said he thought Norwich was to be very much congratulated upon its builders. He knew of no other city in which there were so many really good men as builders. Unfortunatele their clients were not so generous as they might by Incidentally he mentioned that he thought it was most important that a Town Hall should be built. Mr. J. B. Pearce also responded, and spoke highly of the Norwich and Norfolk builders. Mr. A. E. Collins further responded, and said the work of the Norwich builders as a rule would bear favourable comparison with that of builders in other towns. The Mayor proposed "Success to the Norwich and District Master Builders' Association." He said no trade could prosper without a certain amount of trades-unionism. Trades-unionism began with the bar; it went to the legal profession, and it was predominant in every trade throughout the United Kingdom. The President, in responding, said the Association had been established for three years. He thought that it was only right that the master builders should unite together, for they had many grievances—grievances against the architects, grievances against the men. He would like to see a good arbitration clause in all contracts, for he did not think one man should have full control of a job. The builders felt that they should be united, not for aggression or for the oppression of the men, but for defence only. Moreover, by means of the Association, petty jealousies were removed, for they met and consulted together as friends. During the last year the Association had been allowed to formulate a book of daywork prices, which would establish a uniform rate for the whole city. The builders of Norwich, through their Association, were now united with all the great centres of industry throughout the country. "The Health of the Merchants of Norwich" was proposed by Mr. W. S. Daws and responded to by Mr. C. Cunnell and Mr. R. Jewson. Mr. J. Youngs proposed "The Health of the Visitors," and Mr. S. Smith (Staffordshire) responded.

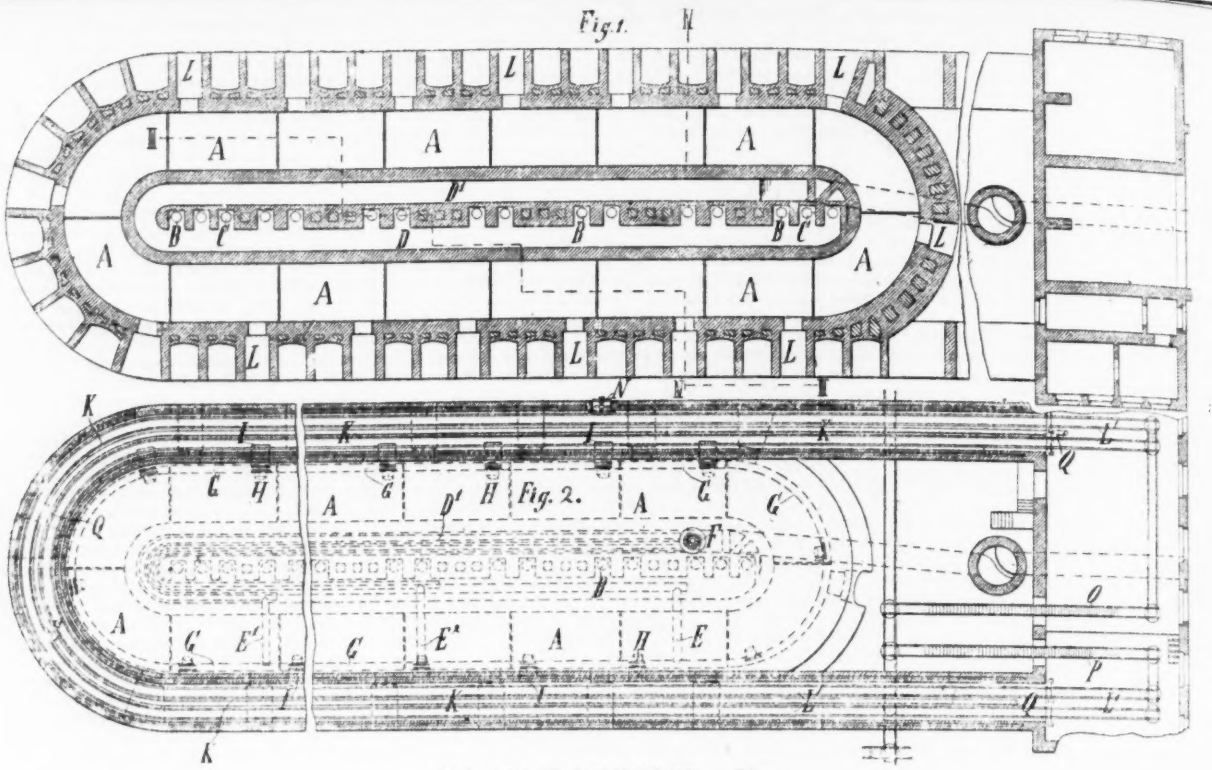
LABOUR MARKET IN THE COLONIES.—The April circular of the Emigrants' Information Office (31, Broadway, Westminster) states that in New South Wales the severe drought of last year badly affected the labour market. The large expenditure, however, on public works during the year considerably diminished the distress, and latterly prospects have improved, and the renewed activity in the building trade has benefited other industries also. But reports from various towns state there is still no demand for more emigrants, except occasionally for a few blacksmiths and carpenters, and at Broken Hill for skilled miners. In Victoria the increase in the values of exports and imports in 1899 shows the increasing prosperity of the colony. A report from Melbourne states that mechanics are now fully employed in all trades, especially the iron trade, at wages slightly higher than formerly. There is a good demand, which is likely to continue, for a limited number of thoroughly skilled plumbers on the Melbourne drainage works; otherwise there is not much improvement throughout the colony in the general demand for labour. With regard to South Australia the labour market has been generally dull during the past year, and there is still practically no demand for more men. At Port Pirie, in the north, there is a limited demand for mechanics at 10s. per day of eight hours. In Queensland there is an increasing demand for mechanics, but not at Mackay or Charters Towers With regard to Western Australia, it is stated in the annual report of the Government Labour Bureau for 1899 that, as far as the Bureau was concerned, no really able bodied man, honestly desirous of finding employment, remained idle for a very lengthened period. There was a considerable demand for farm labourers throughout a portion of the year. It was difficult to find employment for clerks, accountants, book-keepers, and that class of labour. At the end of the year stone-masons, carpenters, engine-drivers, and general labourers were in demand at East Coolgardie; really good men could get work at Perth; and there was some demand for miners and general labourers in the Yalgoo district. In other places the supply of labour was sufficient. In Tasmania the best opening is for skilled miners and mechanics on the west coast. The last reports from New Zealand show that there was plenty of work there. The places in which mechanics in the building and engineering trades seem to have been specially busy were Auckland, Napier, Greymouth, Christchurch, Dunedin, and Invercargill. Persons are warned against going to South Africa in search of work, as long as the war lasts.

ST. JAMES'S HALL, PICCADILLY.—It is reported that at a recent meeting of the shareholders of the St. James's Restaurant the chairman said that the block of buildings between St. James's Hall and Air-street, Piccadilly, will be pulled down shortly, and it is rumoured that St. James's Hall site will also be included within the scheme for rebuilding. St. James's Hall, comprising the large concert-room, 140ft. by 60ft. and 60 ft. high, and two smaller rooms, was built and decorated after the designs of Owen Jones in 1857, and has been used during many years for the concerts given by the New Philharmonic Society, and for the Saturday and Monday Popular Concerts. The restaurant buildings were added twenty-five years ago.

GUILDHALL, LONDON.—The porch, built in the former half of the fifteenth century, has recently been repaired and renovated in pursuance of a vote of the Common Council, some decayed stone having been exposed by the removal last year of the cement and plaster with which the porch had been covered. The porch, which escaped from material injury by the Great Fire, was left by Dance the younger when he, in 1789, took down the old and highly enriched south front, substituting the present façade. The statues, formerly in the porch, are illustrated in Carter's "Ancient Sculpture and Painting"—they represented Our Saviour, Religion, Law and Learning, and the Virtues. They were given to Thomas Banks, R.A., and after his death were bought for 100*l*. by Mr. Banks, M.P.

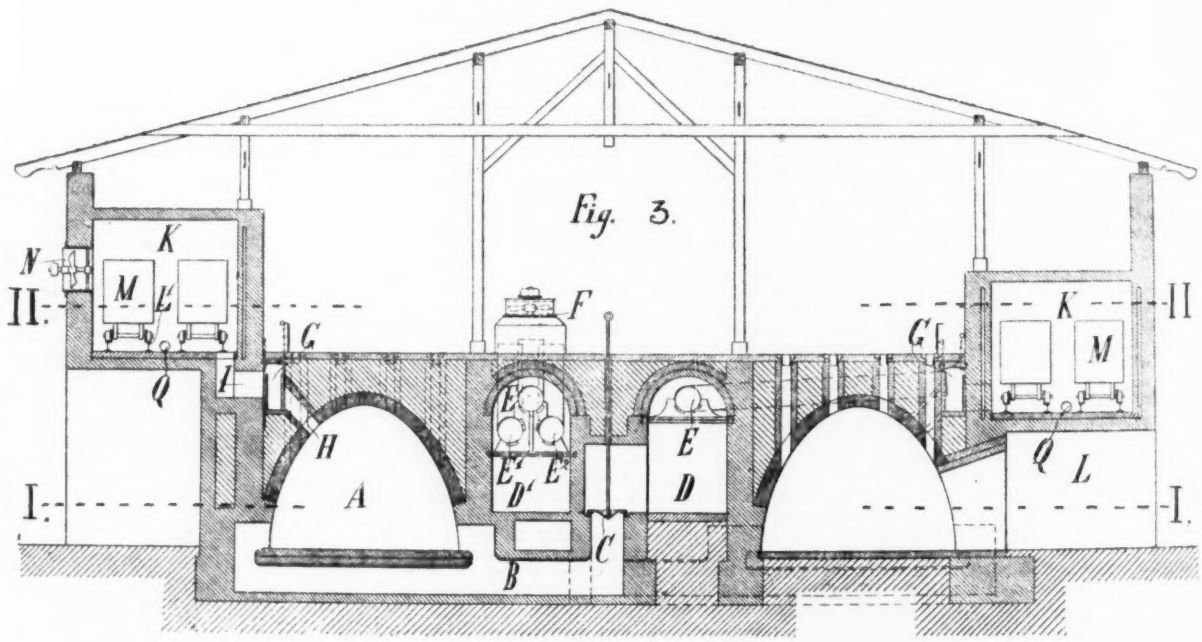
IMPROVEMENTS AND WORKS IN THE CITY.—Mr D. J. Ross, the City Engineer, reporting to the Corporation on the works executed in his department last year, states that three ventilating shafts have been erected, making 314 in all in the City. The number of premises drained is 156, and of dangerous structures reported on ninety-five. The new street from Fenchurch-street to Crutched Friars, called "Lloyd's-avenue," was opened in November. Negotiations have been continued for the acquisition of the properties required to complete the widening of Fenchurch-street between Cullum-street and Ironmongers' Hall. There now only remains the frontage of a single house to be set back in order to complete the improvement. The widening of Fleet-street between Ludgate-circus and Salisbury-court will shortly be completed. Considerable progress has also been made with the widening of Fleet-street at its western end. The widening of Cheapside has been completed between Paternoster-row and St. Paul's-churchyard, and progress has been made in the widening of Lower Thames-street between Fish-street-hill and Botolph-lane, where the new thoroughfare will be 60 ft. wide. The number of defective public gas lights during the year was 192. The gas lamps now in use number 1,906, and the electric lights 507. The question of lighting the side streets by electricity is still under consideration.

ELECTRIC LIGHTING, ROTHERHAM.—On the 28th ult. Mr. E. A. Sandford Fawcett, an inspector to the Local Government Board, held an inquiry in the Rotherham Council Hall relative to an application by the Corporation to borrow a sum of 27,969*l*. for electric lighting purposes. Mr. B. Jenkin, partner with Professor Kennedy, explained the works; and Mr. J. Platts, architect, of Rotherham, gave details of the proposed building.



Heinrichs's Patent Brick Kiln. Plans.

Fig. 1.—Plan at I. (see section). Fig. 2.—Plan at II.



Heinrichs's Patent Brick Kiln.

Fig. 3.—Cross section to larger scale.

HEINRICHS'S PATENT BRICK KILN.—This is a form of kiln, shown in the accompanying plans and enlarged section, patented by Mr. Wilhelm Heinrichs, of Barmen (Rhenish Prussia), by which the heating gases are utilised for warming and drying the new bricks before they are placed in the kiln. The general plan of the kiln may be of any form (circular, oval, or any other shape) so long as it retains the character of a closed ring. By means of partitions the inner space is divided into chambers, A; these chambers are accessible by doors L from the outside, and by means of bell-damper doors C (see section) they communicate with the smoke collector channel by a channel B. This smoke collector is divided by a partition wall, so as to form two channels D and D^1 communicating with each other at the end furthest away from the chimney. The outlet channels B of all the furnace chambers lead into the channel D, so that all the heating gasses will be compelled to pass always at least a certain part of the channel D, and then the whole length of channel D^1, that is at least once along the whole length of the furnace. In the upper part of the channels D and D^1 are placed a system of heating-tubes; in the example shown three are used—E, E^1, E^2—beginning at the side near the chimney and going then along through the channels D and D^1. The beginning ends of these tubes are connected to a fan or other suitable blowing machine F, blowing air into them, and their outlet ends lead into the channel G, which goes round the whole furnace, at the side of the channel D; the tubes E, E^1, and E^2 end at different parts of the channel D, so as to divide the air blown in by them evenly through the whole channel, as best seen in fig. 2. This channel G is connected to each chamber by a passage H, which can be shut off by a sliding door, and it also communicates by means of openings I with the drying-room K going all round the furnace above the filling vaults of the chambers. The openings I can also be closed by suitable doors or lids (not shown on the drawing). This has for its object to exhaust the heat from the chambers when the bricks therein are completely burnt, so that they may be cooled quicker, and also for the sake of utilising this heat. The drying-room K has its beginning or entrance end at this side of the channel D^1; it goes all along the furnace, turning at the end opposite the chimney and leading then back towards the entrance side; it it is closed by brickwork, and has sliding doors at the entrance and exit ends. From the entrance to the outlet its sole or base is slightly inclined. Rails L^1 are laid on the floor of the drying-room, on which the wagons M, containing the bricks to be dried, are carried slowly through it, moving forwards by their own weight on the inclined plane, or, if necessary, being pushed by mechanical power. In order to draw off the saturated air from the drying-room, one or more fans N are arranged at the side opposite to that of the inlet openings of the pipes E. An inclined plane O (fig. 3) is arranged for raising the wagons with fresh bricks up to the entrance of the drying-room, and a similar incline P serves to carry them further when they come out of the drying-room at the other side. Pipes Q for leading exhaust steam through the chamber K may be placed on the floor of the drying-room, as indicated in figs. 2 and 3.

NEW CLOCK, SHANKLIN.—A large striking clock with four dials is to be placed in the tower on the parade at Shanklin, Isle of Wight. It will have all the latest improvements, and is being erected by Messrs. John Smith & Sons, of Derby.

APPOINTMENT.—Mr. A. Paul MacAlister (Messrs. MacAlister & Tench, architects, of Norwich, Cambridge, and London) has been elected permanent architect to the Cambridge County and Town-Asylum at Fulborne, Cambs.

HIGHGATE ARCHWAY.—The last piece of constructional steel-work of the new Highgate Archway was put in place on the 30th ult. As it was being lowered into position the workmen below demolished the last piece of the "roof" of the old brick and stone arch. Much work remains to be done before traffic can be resumed in the ordinary way, such as the demolition of the retaining walls of the

old fabric, ornamental and painting work on the new, and the making of the overhead roadway. The new arch is dated 1897, and on the London side the steel-work has been picked out in various shades for the authorities to choose from.

SALE OF TIMBER.—At the King's Arms Hotel, Godalming, Messrs. Collier, Son, & Sparkes, auctioneers, submitted for sale some 1,700 oak and ash trees standing on the Woolmer Lodge estate, Liphook, the Sachel Court estate, Alfold, and the Andrew's Hill Estate, Billingshurst. The competition was keen and spirited throughout, and the auctioneers had no difficulty in disposing of the various lots at what were considered satisfactory prices. The principal purchasers were Mr. John Wood, Leatherhead; Mr. J. Longley, Cheesworth, Horsham; Mr. M. W. Marshall, Godalming; Messrs. Foster & Co., Emsworth; and Mr. W. Wiltshire, Epsom. The total sum realised by the auction was upwards of 3,000*l.*

THE EDISWAN REVOLVING SHADE LAMP.—This portable electric lamp called the "Comet" shade lamp, consists of an enamelled or plated cylinder which revolves in a wire cradle, enabling the light to be thrown in any direction. The eye-shade, which serves as a reflector as well, may be moved by a touch to any desired angle, so that a desk, table, or other desired object alone may be illuminated, and all sharp shadows prevented. The standards are adjustable, and are made in polished oak and also in metal. It is manufactured by the Edison & Swan United Electric Light Company.

IMPROVEMENTS AT THE MANSION HOUSE, DUBLIN.—An extensive renovation scheme has just been carried out at the Mansion House, Dublin. The exterior and interior have been repainted, and new panelled ceilings have been placed in the entrance-hall and over the principal staircase. The drawing-room has been redecorated, and a new raised plaster ceiling has been added. In the Round Room the City Arms have been painted over the entrance, and the casts of some of Foley's works have been cleaned and rewhitened. The work has been carried out under the supervision of Mr. C. J. M'Carthy, the City Architect, by Messrs. Sibthorpe & Co., of Dublin. A new stained glass window, which has been placed over the principal staircase, was the work of Mr. Clark. The new electroliers were supplied by Messrs. Edmundson & Co. and Messrs. Edison & Swan. The total cost was about 7,000*l.*

MAUDSLAY, SONS, & FIELD'S WORKS, LAMBETH.—The London and South-Western Railway Company have recently acquired the site of Maudslay, Sons, and Field's marine-engine works and foundries in Westminster Bridge-road, Lambeth, for an enlargement of their line. The engineering company will carry on their works at East Greenwich as heretofore, but in the course of next April will sell by auction, on the premises at Lambeth, a costly collection of engineers' tools, plant, and machinery by Whitworth, Naysmith, Muir, Buck & Hickman, Shepherd Hill & Co., Allcard & Slack, Tangye, and other well known machine-tool makers.

CAPITAL AND LABOUR.

ABERDEEN JOINERS' STRIKE.—The attempts to settle this dispute by concessions have been unsuccessful, and both sides are reported as determined not to yield. A considerable number of operatives have left Aberdeen for other places.

ARBROATH JOINERS.—A meeting of the Arbroath Operative Joiners was held on the 30th ult., when the men considered the intimation made by the masters to reduce their wages from 8d. to 7½d. per hour. It was stated that the masters still adhered to their intimation. After consideration the men resolved that if the wages were reduced, as stated, they would come out on strike.

KIRKCALDY JOINERS' WAGES.—Kirkcaldy master joiners have decided to reduce the men's wages by ½d. per hour, this resolution being come to as the result of the slackness in the trade. The annual agreement between the masters and the men has also been considered by the employers, who have agreed to adhere to the present arrangement. The Building Trade Federation have resolved to support the masters in regard to the lowering of the wages.

CARPENTERS AND BRICKLAYERS' STRIKE, TAUNTON.—The carpenters and bricklayers of Taunton are on strike to the number of about 240 men, in consequence of their demand for an increase of wages not having been acceded to by their employers. The demands of the men are an increase of 1d. per hour in pay, thus raising the standard rate of wages from 6d. to 7d.; and a new code of working rules to include the following:—"That from March 1 to October 31 the working hours on the first five days of the week shall be from 6 a.m. to 5.30 p.m., with half an hour for breakfast and one hour for dinner, and on Saturdays from 6 a.m. to 1 p.m. In the winter months, from November 1 to March 1, that the hours be reduced to forty-eight per week, with half an hour for breakfast and one hour for dinner each day." The master builders are willing to adopt the new rule given above, but decline to grant the advance in pay; hence the strike.

LEGAL.

A WEST END LIGHT DISPUTE SETTLED.

THE case of Ford & Sons *v.* The Hotel and Club Investment Company, Limited, came before Mr. Justice Grantham and a Special Jury on the 20th ult. It was an action brought by the plaintiffs for alleged infringement of ancient rights to light. The plaintiffs are the owners of Brown's Hotel, Nos. 21, 22, 23, and 24, Dover-street, Piccadilly. On the west side of these houses are eighty-two windows, all of which the plaintiffs claimed as being ancient lights. On the opposite side of the street is No. 35, Dover-street, known as the Empress Club, which the defendants shortly before the commencement of the action began to pull down and rebuild, in consequence of which it was alleged the quantity of light coming through a number of the plaintiffs' windows was materially diminished. The plaintiffs said that the defendants threatened to continue the building, and thereby to obstruct the light of other windows. The plaintiffs claimed to be entitled to an injunction that the structure already erected should be pulled down. There was also a claim for damages.

The defendants, while denying the obstruction, also denied that the plaintiffs' lights were ancient. They also alternatively brought 100 guineas into Court to meet the plaintiffs' claim.

Eventually the case was settled on terms not stated.

Mr. Dickins, Q.C., and Mr. G. F. Spence appeared for the plaintiffs, and Mr. McCall, Q.C., and Mr. Clavell Salter for the defendants.

IMPORTANT ACTION BY CONTRACTORS.

THE hearing of the case of Leslie & Co., Limited, *v.* The Managers of the Metropolitan Asylum District, was concluded before a Divisional Court of Queen's Bench, composed of Justices Bigham and Phillimore, on the 2nd inst., the question in issue arising upon a contract entered into between the plaintiffs and the defendants for the erection of a hospital for infectious fevers at Hither Green, Lewisham, the case coming before the Court by way of appeal by defendants from the decision of an Official Referee. A great part of the work in question had been let out to sub-contractors and experts, and the question to be decided was as to who was to be responsible for alleged delay on the part of these sub-contractors. The contract, which was dated July 23, 1895, provided that the plaintiffs should execute "the works" shown on the plans, including the chimney stacks and heating apparatus. The time in which the work was to be completed was two years, and the price was to be 210,000*l.* The material clauses of the contract were these:—(33) The managers (viz., the defendants) reserve to themselves the right to employ other parties to execute the works for which provisions are made, and to deduct the full provided amounts (*i.e.*, the prime cost plus 10 per cent. thereon) from the contract sum. In such cases the contractors (the plaintiffs) are to allow such parties every facility for the execution of their several works simultaneously with their own. The managers are to be at liberty to omit any provisional sums or quantities. The contractors are to pay the sub-contractors the amount provided in the contract for such purpose, or less or more as may be certified, and the payments thus made will be considered as work done by the contractors, and will be included in the certificate to the contractors next following such payment. No payment is to be made to such sub-contractors, except upon the architect's certificate. The contractor is to pay such amount as may be certified from time to time, within seven days from the date of the certificate, and should the contractor neglect, or refuse, to make such payment within the said period, the managers shall be at liberty to pay the amount direct to such sub-contractor, and to deduct from the contract sum the gross amount which the contractors have included in their estimate in respect of such work and his profit thereon, the amount so to be deducted not being less in any case than such amount so certified. The contractors are to attend with all building trades upon the sub-contractors, which is to include "cutting away from the same and making good after the same, and allowing the free use of such plant, tackle, and scaffolding as the contractors may be using for their own purposes." The contract also provided that the contractors were to allow such persons full opportunity to carry on their works simultaneously with their own. The contract also provided for the retention by the defendants of 10,000*l.* as security for its due performance. Alterations and omissions from the specifications were to be allowed, and made only on the direction in writing of the architect. Among the works to be erected were twenty-nine chimney-stacks at the price of 137*l.* 10*s.* for each stack. The contract went on: "The contractor shall provide the sum of 137*l.* 10*s.* prime cost for each central stack of flues in large wards above the level of the ground floor." It then provided how they were to be constructed, and that they were to be finished complete by a specialist potter. It also provided that the contractors were to supply all necessary "scaffolding, plant, water, and hoisting." The plaintiffs then communicated with Messrs Doulton, who agreed to do the necessary work. Part of the claim in the action arose from the alleged delay on the part of Messrs. Doulton to do the necessary work. Another claim arose from a sub-contractor for the supply of the necessary steam and hot-water apparatus. The clause relating to that provided that the hot-water supplies to baths, lavatories and sinks, except where otherwise specified, should be done by specialists; but the contractor was to attend on, and cut a way for, and make good after them. A sub-contract was made on February 2 between the plaintiffs and Messrs. Berry & Sons, by which the latter agreed to supply this apparatus for 11,900*l.*, and it was said that Messrs. Berry had been guilty of delay in executing this work. Owing to these alleged delays, the plaintiffs could not complete their works and get the architect's final certificate and payment accordingly. The plaintiffs therefore claimed damages on the footing that there was an obligation on the defendants to see that the work was done by the specialists and sub-contractors within a reasonable time. The case was referred to an Official Referee, when counsel for the defendants asked the learned Referee to non-suit the plaintiffs on the ground that Messrs. Doulton and Berry on the contract were the sub-contractors with the plaintiffs, and any delay lay against them and not with the defendants. The learned Referee refused to non-suit, and this was a motion by way of appeal from the refusal.

At the conclusion of the arguments of counsel, the Court held that it was the duty of the plaintiffs to see that the contracts with the sub-contractors and specialists contained clauses and provisions which should either have enabled them to complete their works within the specified time or should specify penalties in the nature of damages to compensate the plaintiffs if, through delay of the specialists, the plaintiffs were unable to carry out their contract with the defendants. If the plaintiffs had failed to protect themselves in this way it was a misfortune which they must bear themselves. In these circumstances, the learned Official Referee ought to have held that these damages were not recoverable. The appeal was accordingly allowed.

Mr. English Harrison, Q.C., and Mr. H. Smith appeared for the defendants (appellants); and Mr. R. M. Bray, Q.C., and Mr. T. Ribton for the plaintiffs (respondents).

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

25,155.—ARTIFICIAL MARBLE, GRANITE, STONE, &c.: *T. W. Yames.*—The various compounds are made of calcined chalk, ground borax, mica dust, and soluble silicate—for statuary or white marble, with a colouring of oxide of manganese and slag; of soluble silicate, slate dust, slag, elemi, and chalk—for Kilkenny or green marble, with salt, blue vitriol, sulphuric acid, chalk, elemi, and borax, for colouring; of red and yellow oxides of iron, powdered slag, slate dust, chalk, and hydraulic lime, with similar colouring substances—for Aberdeen granite; and so on for black-veined or Bardilla marble, grey or Portland granite, and Devonshire red marble or spa; when half-dried, the moulded compositions are stamped in imitation of grain, veins, &c., the recesses being filled with colouring material, and a glaze is produced by working their surfaces with plate-glass slips.

25,163.—PLUG COCKS: *J. & T. H. Nodder.*—For locking the plug of a closed gas or other cock a screw is taken out and the plug is turned until a bolt, which is pressed with a spring, engages with holes in the washer and the nut, the plug's upper portion can then be screwed off; for unlocking the tap the bolt is to be raised by putting a wire into the holes in the washer and nut.

25,217.—ELECTRICAL LIGHTING: *R. Echlermeyer.*—For minor installations, a spring and train of wheels drive a dynamo, which is set in parallel circuit with a secondary battery. The dynamo is started by closing a switch, whereupon an electro-magnet attracts a rod from the action of a spring, and releases a stop-pin upon a wheel. The rod drops into the pin's path, and stops the dynamo, when the magnet circuit is broken.

25,218.—GULLEY TRAPS; AND GRATINGS: *F. G. S. Ham, W. E. Baker, & C. M. Sanson.*—In order to leave a water-way, the grating is pivotted nearer than is customary to the middle of the opening; the water is deflected by a plate into a chamber, whence it overflows into another chamber having a bell-siphon, which is fitted with a flange luted to the trap's bottom, and has a handle upon its bell, so that it may be easily removed. For traps made of earthenware, the deflecting-plate is formed in the body of the trap.

25,266.—AN INSTANTANEOUS-GRIP VICE: *D. F. Dowey.*—The adjusting screw is journalled in the movable jaw upon the slide, to which is fixed a wedge for engagement with the nut's sloped lower face, whilst the nut's upper face has teeth that engage with a range of teeth upon the vice's fixed part. When the screw is turned backwards, the teeth become disengaged and the slide moves freely; but when the screw is reversed, the teeth engage and the work is gripped.

25,267.—ALTITUDE AND AZIMUTH CIRCLES OF SURVEYING INSTRUMENTS: *F. C. Fergusson.*—The inventor's purpose is to dispense with the corrections for horizontal distance, linear altitude, &c., in the use of surveying instruments employed with a staff for levelling and so on, which corrections are commonly necessary when a staff is sighted at an angle other than 90 deg. with the telescope's axis; the circle is graduated to one-half of its circumference in angles, being read by means of a vernier upon fixed horizontal arms, which are secured to the stand; the other half—to be read from the vernier's central arrow—is graduated in tangents upon four octants, the line of graduation, divided into one hundred parts, is put at a distance equal to its own length from the centre from which radial lines are set out to the divisions, whilst the circle is marked by them as they cross it. In operation, a properly-divided staff is set up at a distant point, the telescope is levelled and directed, and is then turned through a certain number of the divisions; then the horizontal distance is given by the product of the distance, which is intercepted upon the staff between the two lines of sight, and the constant of the instrument, divided by the number of divisions through which the telescope has been turned, the percentage of inclination also is given by the reading upon the circle; in the case of azimuth observations—say for determining the latitude and departure in setting off courses—an azimuth circle similarly marked is used, and the staff is held in a horizontal position.

25,304.—ARTIFICIAL STONE, BY CASTING CEMENT: *R. Koepp & Co.*—In order that the cement may freely expand in the course of setting in the mould much of the water is removed by suction before the mass begins to set, holes are made in the core, mould, &c., and a vacuum of from 40 to 50 cm. is produced with an air-pump or with water or steam jets. The suction may also be induced by the use of a porous base made of gypsum, sponge, some tufaceous stone, or porous carbon, for the mould, covered with a finely-meshed web.

25,305.—A COATING FOR MOULDS: *H. Stanning and T. Aldcroft.*—A composition for coating moulds is made of asbestos four-fifths, washing soda one-tenth, and clay one-tenth (by weight in each instance). For green sand moulding it should be used in a powdered state, but in a liquid state for dry sand moulding.

25,316.—STOVES: *A. Lacolle.*—At the lower part of the cylindrical grate is fitted another grate, under which are two screws whose threads project through the grate bars and have recesses, the fire can be stirred and clinkers be cleared away from the bars by turning the handles, at the sides, of the screws; by disengaging two hooks and removing the screws, the whole grate may be released. Above the grate is a washer which serves to sustain the lining of fire bricks having projecting and re-entering parts which form circulating flues, and on their top is a fireclay dome fitted with a door—to be opened with rods and handles—which shuts a funnel-shaped receiver for the fuel.

25,323.—PACKING FOR PIPE JOINTS: *P. Hulburd.*—The device, which is intended for flanged and other pipe joints, consists of a copper or other packing ring, which has another ring of tin-plate that rests against the bolts and so keeps the pipe's bore and the ring in the alignment desired.

25,335.—METHOD OF HEATING DWELLINGS, ROOMS, HALLS, &C.: *T. Scotland.*—The heating-medium is caused to circulate through hollow metal wall-skirting or tubes. The skirting may consist of a single tube, or it may be formed in parts; for heating by means of warm air, tubes can be fitted in the skirting, through which air enters the building from a shaft.

25,352.—SAFETY APPLIANCE FOR CAGES, LIFTS, AND HOISTS: *J. Morgan.*—Upon a breakage of the hoisting-rope, a lever which is fastened on to the hook causes a spring-rod to turn two eccentrics, in order that their serrations may engage with the guide-rods, and so arrest the cage's fall; levers upon the shaft of the spring-rod are moved by stops fixed at the well's top and bottom, and thereby free the serrations from the guide-rods when the lift is either at rest or being suspended.

25,384.—APPARATUS FOR USE WITH CRANES: *T. Whitaker.*—Instead of the common spur gearing for effecting the slewing motion, the inventor devises a large and a small pulley, around which are wound two ropes in opposed directions, the ropes being secured to springs, and he claims that shocks upon stoppage of the crane will thereby be obviated.

25,523.—CANS FOR PAINTS, VARNISHES, STAINS, &c.: *R. A. Matthews.*—The cans are made of two parts soft-soldered together; upon the lower part's upper edge are attached ears for a small handle of wire which is arranged to fall upon the outside or to rest within the lower part into which the upper part is socketed; when the can is empty its two parts are taken asunder, the upper part with its neck serves as a funnel, and may be used, when inverted, with a strainer, whilst the lower portion of the can may be used as a paint kettle, and for similar purposes.

25,535.—FIXING HOOKS, &C., TO WALLS, CEILINGS &C: *L. Barlow.*—To take the place of an ordinary screw or nail that will not hold is contrived a hook, whose shank freely fits within a split tube, provided with a flange, and having a cone-shaped part which ends in a screw. When the shank has been driven into the wall as far as its flange will allow, the hook (or ring or knob) is pulled away, so that its cone spreads out the split tube and thereby forms strips which bear against the wall's remoter side.

25,683.—VENTILATING GULLEY TRAPS: *E. A. Green.*—The gulley trap, which takes both internal and external waste pipes, is built into the wall's face; a dip-plate, in which the seal is formed, has an opening, for purposes of inspection, closed with two covers having a clay lute between them; a vertically hinged grid provides for ventilation of the trap. In the case of a ventilating wall-box for drains and manholes, access to the drain is gained by means of a sliding cover arranged at the level of the pavement.

MEETINGS.

FRIDAY, APRIL 6.

Architectural Association.—Mr. Basil Champneys on "Hints on the Study of Planning of Collegiate Buildings." 7.30 p.m.

Royal Institution.—Professor Dewar on "Solid Hydrogen." 9 p.m.

Institution of Junior Engineers.—Mr. Eustace W. Porter on "A Comparison of Railway Bridge Structures of Moderate Dimensions and of Methods of Determining their Working Loads. 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. H. E. Wimperis on "Experiments on Struts With and Without Lateral Loading." 8 p.m.

SATURDAY, APRIL 7.

Architectural Association.—Fifth spring visit, to Lord Windsor's house at the corner of Park-street and Mount-street, Park-lane, W. Mr. F. B. Wade, architect. 2.30 p.m.

Royal Institution.—Lord Rayleigh on "Polarised Light," VI. 3 p.m.

British Institute of Certified Carpenters.—(1) Visit to St. Saviour's, Southwark. 3 p.m. (2) Monthly meeting, Mr. W. F. Sweett on "Air-tight Case Making." 6 p.m.

Sanitary Inspectors' Association.—Paper by Dr. G. M. Lowe, M.D., on "Damp Houses—Causes and Effects." 6 p.m.

Edinburgh Architectural Association.—Visit to (1) Balvaird Castle. (2) Edenshead (formerly Pitlochy).

MONDAY, APRIL 9.

Royal Institute of British Architects.—Adjourned discussion on "Ancient Lights." 8 p.m.

Bristol Society of Architects.—Annual General Meeting. 8 p.m.

Institution of Mechanical Engineers.—7.30 p.m.

Dundee Institute of Architecture.—Visit to Glasgow.

TUESDAY, APRIL 10.

Institution of Civil Engineers.—Papers to be read and discussed: 1. "The Development of the Manufacture and Use of Rails in Great Britain," by Sir Lowthian Bell, Bart.; 2. "The Wear of Steel Rails in Tunnels," by Mr. Thomas Andrews, F.R.S. 8 p.m.

Sheffield Society of Architects and Surveyors.—Annual meeting: election of officers, &c.

WEDNESDAY, APRIL 11.

Institute of Sanitary Engineers.—Examination and literary committee at 2.30 p.m. General purposes and finance committee at 3.30 p.m. Election committee at 5 p.m. Members' sessional meeting at 7 p.m.

FRIDAY, APRIL 13.

Glasgow and West of Scotland Architectural Craftsmen's Society.—Mr. T. S. Fraser on "Principles of Practical Design." 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 19.—By J. BAYLY and DOUGLAS YOUNG & Co. (at Margate).

Margate, Kent.—Northdown-rd., Cedar Lodge, f.	£780

March 22.—By COLES & Co. (on Premises).

Bayswater.—79, Kensington Gardens-sq., u.t. 55 yrs., g.r. 25*l.*, e.r. 140*l.*	1,030

By STIMSON & SONS.

Peckham.—62, 64, and 66, Gordon-rd., f.	1,120
Greenwich.—20, 22, and 36, Greenwich-rd., f.	1,140
Bermondsey.—116, Southwark Pk.-rd., u.t. 37 yrs., g.r. 5*l.* 17s., r. 45*l.*	440
76 and 78, Rouel-rd., u.t. 34½ yrs., g.r. 8*l.*	550

By COURTENAY, WELLS, & Co. (at Croydon).

Croydon.—St. Augustine's-av., &c., 20 building plots, f.	2,660
Whyteleafe, Surrey.—Godstone-rd., three plots of land, f.	475
Croydon.—3 and 5, Handcroft-rd., f.	700
31 and 32, Westfield-rd., f.	455
17 and 19, Pemdevon-rd., f.	755
Tottenham.—Clyde-rd., f.g.r. 31*l.* 10s., reversion in 98 yrs.	810

March 23.—By EASTMAN BROS.

Dulwich.—Townley-rd., f.g.r. 20*l.*, reversion in 76 yrs.	550

By FURBER, PRICE, & FURBER.

Regent-st.—58, Conduit-st., Corporation leasehold, g.r. 4*l.* 7s. 6d., fine 30*l.* 12s. 6d., r. 330*l.*	8,600
St. John's Wood.—14, Upper Hamilton-ter., u.t. 39½ yrs., g.r. 7*l.* 10s., e.r. 380*l.*	3,600

By T. E. WESTACOTT.

Holloway.—83, Brecknock-rd., u.t. 41 yrs., g.r. 8*l.*, e.r. 52*l.* 10s.	500
Camden Town.—Gt. College-st., i.g.r. 60*l.*, u.t. 25 yrs., g.r. 20*l.*	450
Priory-st., i.g.r. 14*l.*, u.t. 25 yrs., g.r. 2*l.*	130
Kentish Town—Ferdinand-pl., i.g.r. 27*l.*, u.t. 34 yrs., g.r. 6*l.*	280
26, Ferdinand-pl., u.t. 34 yrs., g.r. nil.	200
Camden Town.—14, 22, and 24, Wellington-st., u.t. 11¼ yrs., g.r. 15*l.* 15s., r. 101*l.*	430

March 26.—By Messrs. KEMSLEY.

Ilford, Essex.—Hampton-rd., a block of building land, f.	£1,360

By ALFRED RICHARDS.

Enfield.—Bush Hill, Bush Hill Cottage, and 1¼ acre, f.	1,080
Highgate.—2, South-grove, f., r. 38*l.*	550

By ROBINS, GORE, & MERCER.

Chelsea.—26, Blantyre-st., u.t. 63¾ yrs., g.r. 7*l.*, r. 50*l.*	915
Brixton.—28, Elliott-rd., u.t. 63¾ yrs., g.r. 5*l.*, r. 32*l.*	440

March 27.—By DEBENHAM, TEWSON, & Co.

Marylebone.—27, Duke-st., f., r. 82*l.*	1,355
29 and 30, Molyneux-st., f., r. 84*l.*	1,600
Knightsbridge.—17, Hill-st., u.t. 39 yrs., g.r. 7*l.* 7s., r. 60*l.*	800
Paddington.—23, St. Mary's-ter., u.t. 39 yrs., g.r. 12*l.* 13s., r. 60*l.*	405
Battersea.—10, Victoria-rd., u.t. 74 yrs., g.r. 7*l.* 10s., r. 40*l.*	355
Acton.—Avenue-gardens, Strathray and Westbury, u.t. 81½ yrs., g.r. 21*l.*, r. 100*l.*	910

By COCKETT & HENDERSON.

Dalston.—8, Gayhurst-rd., u.t. 46 yrs., g.r. 5*l.*, r. 32*l.*	580
Woodford.—48 and 50, Cleveland-rd., f., r. 58*l.*	775
Wanstead.—29, Grove-rd., f., e.r. 40*l.*	405

By H. DONALDSON & SON.

Dalston.—97 and 99, Queen's-rd., u.t. 39 yrs., g.r. 4*l.*, r. 70*l.*	870
93, Forest-rd., u.t. 51½ yrs., g.r. 9*l.*, r. 45*l.*	470

By FIELD & SONS.

Old Kent-rd.—37 to 46, Amery's-pl., and 23 to 63 (odd), Kinglake-st., also l.g.r. 30*l.*, u.t. 51 yrs., g.r. 132*l.*	1,050
Penge.—Anerley Park, Blakewood, f., r. 100*l.*	1,800

By HARMAN BROS.

Plaistow.—2A, 4 to 12 (even), Upper-rd., f.	1,410
Clapton.—271, Evering-rd., u.t. 76 yrs., g.r. 9*l.*	600
Hornsey.—40, Frobisher-rd., u.t. 96 yrs., g.r. 7*l.*, r. 34*l.*	730

By HUNTER & HUNTER.

Shepherd's Bush.—25 and 30, St. Stephen's-av., u.t. 53¾ yrs., g.r. 18*l.*, r. 61*l.*	610
Slough, Bucks.—22, 24, 34, and 36, Mackenzie-st., u.t. 78¾ yrs., g.r. 40*l.*, r. 153*l.*	1,100
Ealing.—20, 33, and 35, Windsor-rd., u.t. 61¾ yrs., g.r. 20*l.* 10s., r. 135*l.*	1,210
South Kensington.—14, Pelham-pl., u.t. 13 yrs., g.r. 7*l.*	350

By MARK LIELL & SON.

Battersea.—6 and 8, Aliwal-rd., u.t. 84 yrs., g.r. 13*l.*	600
Stratford.—17, 19, 21, and 23, Great Eastern-rd., f.	1,050
20 to 30 (even), Salway-rd., f.	1,050
Millwall.—56 and 58, Manilla-st., f.	460
Limehouse.—37 and 39, Eastfield-st., f.	540
6, 7, 8, 9, 11, and 13, Elsa-st., f.	1,000
57, 59, 83 to 99 (odd), Elsa-st., f.	1,360
Stepney.—1 to 8, Causeway-court, f.	515
St. George's East.—89 to 95 (odd), Cable-st., f., r. 72*l.*	1,060
Leytonstone.—Southwell Grove, four plots of land, f.	570

By DRYSDALE, NURSE, & Co.

Homerton.—118, Ballance-rd., u.t. 60 yrs., g.r. 3*l.* 3s.	335

By J. S. RICHARDSON.

Spitalfields.—51, 52, and 53, Gun-st., f., r. 80*l.*	1,500
Highbury.—Corsica-st., f.g.r. 10*l.*, reversion in 88 yrs.	740
Holloway.—Campbell-rd., f.g.r. 10*l.*, reversion in 65 yrs.	910
Bethnal Green.—Bishop's-rd., i.g.r. 12*l.*, u.t. 44½ yrs., g.r. nil	175
Hampstead.—1, Eton-pl., with yard and stabling adjoining, u.t. 45½ and 52½ yrs., g.r. 5*l.*	1,150
3 and 4, Eton Mews West, u.t. 52½ yrs., g.r. nil, r. 60*l.*	65

By FREDERICK WARMAN.

Stamford Hill.—62, Amhurst-pk., u.t. 70½ yrs., g.r. 14*l.*	1,150
Highbury.—20 and 22, Balfour-rd., u.t. 49½ yrs., g.r. 12*l.* 12s., r. 90*l.*	760
Muswell Hill.—Barnard's Hill, West View, u.t. 97 yrs., g.r. 6*l.* 10s., r. 38*l.*	400
Canonbury.—46, Marquess-rd., u.t. 46 yrs, g.r. 8*l.*, e.r. 65*l.*	655
Hornsey.—15, Raleigh-rd., u.t. 83 yrs., g.r. 6*l.* 10s., r. 30*l.*	395

By SCHOFIELD, EVANS, & Co. (at Mason's Hall Tavern).

Pimlico.—Sutherland-st., "White Ferry House" p.-h., u.t. 38 yrs., g.r. 1*l.*, r. 150*l.*	2,300
Wandsworth.—35, Cicada-rd., u.t. 90 yrs., g.r. 7*l.*, r. 36*l.*	405

March 28.—By BARKER & SON.

Leytonstone.—518 and 522, High-rd., u.t. 71 yrs., g.r. 12*l.*, r. 54*l.*	595
55, Ranleigh-rd., u.t. 91 yrs., g.r. 4*l.*, r. 26*l.*	220
Bow.—157, Malmesbury-rd., u.t 47 yrs., g.r. 4*l.* 4s., r. 36*l.*	300

By C. H. BROWN.

Pimlico.—6, Rutland-st., u.t. 25 yrs., g.r. 8*l.*, r. 40*l.*	350

By INMAN & Co.

Hampstead.—7, Garlinge-rd., u.t. 79½ yrs., g.r. 14*l.*	1,150

By G. ERNEST CLARKE.

Chingford.—High-st., Vivian Lodge and Ailsa Craig, u.t. 85 yrs., g.r. 12*l.*, r. 70*l.*	710
Streatham.—87, Lewin-rd., f., e.r. 50*l.*	500
Walthamstow.—75 and 84, Chestnut-av., f.	750
28 and 30, St Mary's-rd., f., r. 60*l.*	885

By C. & H. WHITE.

Brixton.—9 to 17 (odd), Bredon-rd., u.t. 73 yrs., g.r. 25*l.*, r. 171*l.* 14s.	1,270
46 and 48, Craston-rd., u.t. 76 yrs., g.r. 13*l.*, r. 68*l.*	615
168 to 174, 178 to 182 (even), Leander-rd., u.t. 76 yrs., g.r. 36*l.* 10s., r. 231*l.*	2,245
20 and 22, Trent-rd., u.t. 82 yrs., g.r. 18*l.*, r. 100*l.*	1,100

By DOUGLAS YOUNG & Co.

Upminster, Essex.—The Mill Estate, 62a. 1r. 0p., f.	3,000
Sydenham.—5 and 7, Venner-rd., f., r. 80*l.*	1,050
Venner-rd., f.g.r. 20*l.*, reversion in 78 yrs.	520
Plumstead, Kent.—Herbert-rd., f.g.r. 20*l.*, reversion in 65 yrs.	320
Westdale-rd., f.g.r. 7*l.* 10s., reversion in 65 yrs.	200

Balham.—Ryde Vale-rd., f.g.r's. 60*l.*, reversion in *74* yrs. £1,250
Clapham.—69 to 79 (odd), The Chase, u.t. 68¾ yrs., g.r. 69*l.*, r. 320*l.* 2,395
Camberwell.—25 and 27, Harling-st., u.t. 57 yrs., g.r. 10*l.* 355
By BALCH & BALCH (at Camden Town).
Holloway.—58, Langdon-rd., u.t. 77 yrs., g.r. 5*l.* 10s., r. 26*l.* 170
122, Elthorne-rd., u.t. 67 yrs., g.r. 7*l.*, e.r. 38*l.* ... 330
Kentish Town.—34, Preston-st., u.t. 48 yrs., g.r. 5*l.* 5s., r. 34*l.* 270
By CHADWICK & SONS (on the Premises).
Ealing.—66, Eccleston-rd., f., e.r. 25*l.* 320
March 29.—By BROWETT & TAYLOR.
Cheapside.—3, Mumford-court, u.t. 7 yrs., g.r. 50*l.*, r. 280*l.* 920
Newington Causeway.—Avonmouth-st., &c., i.g.r. 155*l.* 2s., u.t. 10 yrs., g.r. 100*l.* 275
Islington.—Essex-rd., &c., i.g.r. 151*l.* 5s. u.t. 13½ yrs., g.r. 26*l.* 140
Camden Town.—142 and 144, Bayham-st., also i.g.r's. 22*l.* 6s., u.t. 53 yrs., g.r. 12*l.* 18s. ..... 35 and 39, Randolph-st., u.t. 53½ yrs., g.r. 14*l.*, r. 72*l.* 365
By FULLER, HORSEY, SONS, & CASSELL.
Lambeth.—Belvedere-rd., Canterbury Wharf, area 25,870 ft. beneficial lease for 23 yrs., r. 1,300*l.* 625
By HERRING, SON, & DAW.
Holborn.—Kirby-st., f.g.r. 180*l.*, reversion in 32½ yrs. 3,400
City of London.—Fenchurch-bldgs., f.g.r. 105*l.*, reversion in 63 yrs. 5,750
By HORTON LEDGER.
Oxford-st.—54 and 56, James-st., f., r. 160*l.* 3,300
By MUSKETT & SONS.
Muswell Hill.—Muswell-av., Venlo, u.t. 97 yrs., g.r. 11*l.* 11s., e.r. 65*l.* 4,185
Wood Green.—49, Acacia-rd., u.t. 63 yrs., g.r. 5*l.*, r. 26*l.* 665
Hornsey.—1, Myddleton-rd., f., r. 25*l.* 210
39, Hornsey Park-rd., f., e.r. 35*l.* 475
By NEWSON, EDWARDS, & SHEPHARD.
Regent-st., 10 and 11, Marshall-st., u.t. 15 yrs., g.r. 146*l.* 15s. 390
Highbury.—163, Highbury New Park, u.t. 49½ yrs., g.r. 15*l.*, e.r. 120*l.* 550
Holloway.—102A and 104A, Tufnell Park-rd., u.t. 64 yrs., g.r. 20*l.*, e.r. 125*l.* 1,000
69 and 71, Campbell-rd., f. 1,525
City-rd.—8, Pickard-st., u.t. 28 yrs., g.r. 5*l.* 16s., e.r. 50*l.* 550
Tottenham.—268 and 270, St. Ann's-rd., u.t. 60 yrs., g.r. 8*l.* 350
By STIMSON & SONS.
Muswell Hill.—6, Colney Hatch Lane, and 1a. 2r. 11p., f. 415
New Cross.—7, New Cross-rd., u.t. 24 yrs., g.r. 5*l.* 2s., r. 40*l.* 3,000
Croydon.—Dominion-rd., a plot of building land, f. 295
By FULLER, MOON, & FULLER (at Croydon).
Croydon.—16, Selhurst-rd. and 227, Gloucester-rd., f., r. 50*l.* 450
55 and 57, Parson's Mead, f., r. 39*l.* 4s. 1,140
56 and 58, Clarendon-rd., f. 675
91 to 101 (odd), Windmill-rd., f. 800
1 and 2, Streatley Villas, f., r. 65*l.* 1,340
March 30.—By C. RAWLEY, CROSS, & CO.
Kensington.—14, Horbury-cres., f., r. 95*l.* 845
8 and 9, Melrose-ter., u.t. 76 yrs., g.r. 12*l.*, r. 78*l.* 1,720
Shepherd's Bush.—60, Bassein Park-rd., u.t. 979 yrs., g.r. 8*l.*, r. 26*l.* 930
Acton Hill.—26, Willcott-rd, u.t. 98 yrs., g.r. 7*l.* 10s., e.r. 45*l.* 290
By MAPLE & CO.
Hampstead-road.—22, 23, and 24, Rutland-st., u.t. 37½ yrs., g.r. 13*l.* 10s., r. 171*l.* 10s. 350
By NORRIS & HADLEY.
Mile End.—Oxford-st., i.g.r. 49*l.*, u.t. 9 yrs., g.r. 12*l.* 2,055
Exmouth-st., i.g.r. 36*l.*, u.t. 13 yrs., g.r. 18*l.* 10s. 240
165

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum: yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard

PRICES CURRENT OF MATERIALS:

WOOD.*

Per Petersburg standard hundred.

	£	s.	d.	£	s.	d.
White Sea: first yellow deals	17	10	0	23	0	0
Second do.	16	0	0	17	10	0
Third do.	13	0	0	14	10	0
Battens, 40s., 30s., and 15s. less respectively.						
Petersburg: first yellow deals	15	0	0	17	10	0
Second do.	12	10	0	13	10	0
Battens, 30s. and 20s. less respectively.						
Petersburg, white deals	12	0	0	14	10	0
Do. white battens	9	10	0	11	0	0
Riga, white deals	10	0	0	11	0	0
Swedish mixed yellow deals	16	0	0	21	0	0
Third do.	14	0	0	17	0	0
Fourth do.	12	10	0	13	10	0
Fifth do.	11	10	0	12	10	0
Battens, 30s., 20s., and 10s. less respectively.						
Whitewood, 10 to 20 per cent. less.						
Finnish unsorted yellow deals	11	0	0	11	10	0
Battens, 10s. and 5s. less respectively.						
Whitewood, 5 to 10 per cent. less.						
Norwegian second yellow battens	8	0	0	8	10	0
Third do.	7	15	0	8	0	0
Fourth do.	7	10	0	7	15	0
Whitewood, 10s. less.						
Danzig, Crown Deck deals, per 40 ft. 3 in.	0	15	0	1	5	0
Brack	0	12	0	1	0	0

* The prices named are for the wood as imported and landed in the docks. Ten per cent., approximately, should be added in order to arrive at the current trade prices.

PRICES CURRENT (*Continued*).

	£	s.	d.	£	s.	d.
St. Lawrence Pine deals, &c., per P.S.H.:—						
1st, Bright and Dry, regular sizes	21	0	0	28	0	0
,, ,, oddments	14	0	0	22	0	0
2nd ,, regular sizes	16	0	0	18	10	0
,, ,, oddments	11	0	0	15	0	0
3rd ,, regular sizes	10	0	0	11	0	0
,, ,, oddments	8	10	0	9	10	0
4th ,, regular sizes	9	0	0	10	0	0
,, ,, oddments	8	0	0	9	0	0
St. Lawrence Spruce deals, &c.						
First, regular sizes	10	10	0	13	0	0
Second ,,	9	15	0	10	5	0
Third ,,	9	10	0	9	15	0
Fourth ,,	9	0	0	9	10	0
Oddments and battens at 20s., 10s., 7s. 6d., and 5s. less respectively.						
New Brunswick Spruce deals, &c.	9	10	0	10	10	0
Oddments, battens, and fourths	9	0	0	9	10	0
United States pitch pine planks and boards	11	0	0	15	10	0
Prepared Boards, per square						
1½ by 6½ and 7 in. 1st yellow		11	0		16	0
,, ,, and ,,		10	6		13	0
1 by 6½ and 7 in. 1st ,,		10	0		12	0
,, ,, ,, white		9	0		10	0
,, ,, and yellow		9	0		11	0
,, ,, ,, white		8	0		9	0
¾ by 6½ & 7 in. 1st & 2nd yellow		7	9		9	6
,, ,, ,, white		7	6		8	6
¾ by 6½ and 7 in. 1st yellow and white (grooved, tongued, and beaded)		8	6		9	6
¾ by 6½ and 7 in. 2nd yellow and white (ditto)		7	6		8	6
¾ by 6½ and 7 in. 1st yellow and white (ditto)		6	6		7	6
¾ by 6½ and 7 in. 2nd yellow and white (ditto)		6	0		7	0
Narrower widths at 10 per cent. less.						
3rd quality at 15 per cent. less than 2nd.						
Danzig and Memel Fir Timber—per load						
Best middling	3	15	0	4	0	0
Good middling and Second	3	5	0	3	10	0
Common middling	3	0	0	3	5	0
Undersized	3	0	0	3	5	0
Swedish and Norwegian Balks	2	10	0	2	15	0
Baltic Oak Timber—						
Danzig and Stettin—Large	3	15	0	4	15	0
Small	3	0	0	3	15	0
Quebec Timber per load						
Yellow Pine	5	0	0	6	10	0
Oak	4	15	0	6	15	0
Elm	4	5	0	4	10	0
Ash	3	10	0	4	5	0
Birch	3	7	6	5	15	0
New Brunswick, &c., Birch	3	5	0	4	0	0
American Pitch Pine Timber	3	17	6	4	10	0
Wainscot, per log, 18 cubic ft.—						
Crown (Eng. & Dutch) } nominal	3	10	0	4	12	6
Brack } nominal	2	15	0	3	15	0
Lathwood, per cubic fathom—						
Petersburg	4	0	0	6	10	0
Riga and Danzig	4	10	0	5	10	0
Norway Poles, per ft. run	0	0	1	0	0	1½
Oak Staves, per mille full size pipe						
Memel, Crown	220	0	0	230	0	0
Brack	190	0	0	200	0	0
Danzig	165	0	0	175	0	0
Bosnia, single Barrel (nominal)	28	0	0	30	0	0
United States, Pipe	37	10	0	45	0	0
Hogshead, extra heavy and double extra	30	0	0	35	0	0
Indian Teake per load	11	10	0	16	10	0
British Guiana Greenheart	0	0	0	8	0	0
Mahogany, per foot superficial—						
Honduras, cargo average	0	0	4½	0	0	5½
Nicaragua, do.	0	0	4½	0	0	5½
Tabasco, do.	0	0	4½	0	0	6
Mexican, do.	0	0	4	0	0	4½
Panama, do.	0	0	3½	0	0	4
African, do.	0	0	3½	0	0	5
Cuba, do.	0	0	6	0	0	8
St. Domingo, do.	0	0	5	0	0	7½
Do. Curls (good to prime)	0	0	9	0	1	3
Walnut, American (logs)	0	3	0	0	5	0
Do. do. (planks and boards)	0	2	0	0	7	6
Italian, per foot superficial	0	0	3	0	0	7½
Black Sea, per ton	6	0	0	12	0	0
Satin Walnut (logs) per foot cube	0	1	0	0	1	6
,, (planks and boards)	0	1	9	0	3	0
Sequoia (Californian redwood), per foot cube	0	1	3	0	2	0
Whitewood, American (logs)	0	1	4	0	1	9
,, ,, (planks and boards)	0	1	9	0	2	9
Quartered oak ,, ,, ,,	0	2	3	0	4	0
Kauri pine (logs)	0	1	9	0	2	0
,, ,, (planks)	0	2	3	0	2	9
Jarrah (planks)	0	2	0	0	2	3
Lancewood spars each, fresh and large	0	5	0	0	7	0
Lancewood spars, ordinary to fair	0	3	0	0	4	0
Degame spars	0	8	0	0	10	0

METALS.

IRON—Pig, in Scotland ton	3	15	6	0	0	0
Bar, Welsh, in London	9	0	0	9	15	0
Do. do at works in Wales	8	10	0	9	0	0
Do. Staffordshire, in London	9	15	0	11	15	0
COPPER—British cake and ingot	81	10	0	82	10	0
Best selected	82	10	0	83	10	0
Sheets, strong	86	0	0	87	0	0
Chili bars	78	10	0	0	0	0
YELLOW METAL lb.		6½d.			7d.	
LEAD—Pig						
Spanish ton	16	12	6	0	0	0
English Com. Brands	16	17	6	0	0	0
Sheet, English, 6 lbs. per sq. ft. and upwards	18	10	0	0	0	0
Pipe	19	0	0	0	0	0
ZINC—English sheet ton	26	10	0	0	0	0
Vieille Montagne	28	10	0	0	0	0
Spelter	21	12	6	21	17	6
TIN—Straits	138	5	0	0	0	0
Australian	138	5	0	138	15	0
English Ingots	143	0	0	144	0	0
Banca	0	0	0	0	0	0
Billiton	0	0	0	0	0	0

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d.	per ft. delivered.
,, ,, fourths	2d.	,, ,,
21 oz. thirds	3d.	,, ,,
,, ,, fourths	2¾d.	,, ,,
26 oz. thirds	4d.	,, ,,
,, ,, fourths	3½d.	,, ,,
32 oz. thirds	5d.	,, ,,
,, ,, fourths	4½d.	,, ,,
Fluted sheet, 15 oz.	2½d.	,, ,,
,, ,, 21 ,,	3½d.	,, ,,

OILS, &c.

Raw Linseed Oil in pipes, per ton	26	10	0	0	0	0
,, ,, ,, in drums, per gal.	0	2	4	0	0	0
Boiled ,, ,, in pipes, per ton	28	10	0	0	0	0
,, ,, ,, in drums, per gal.	0	2	6	0	0	0
TAR—Stockholm barrel	1	6	6	0	0	0
Archangel	1	0	0	0	0	0
Turpentine, in barrels, per cwt.	2	2	0	0	0	0
,, in drums, per gal.	0	3	4	0	0	0
Genuine Ground English White Lead	25	10	0	0	0	0
Red Lead	22	0	0	0	0	0
Best Linseed Oil Putty, per cwt.	0	8	0	0	0	0

BRICKS, &c.

	s.	d.				
Hard Stocks	30	0	per thousand alongside, in river.			
Rough Stocks and Grizzles	28	0	,,	,,	,,	,,
Smooth Bright Facing Stocks	58	0	,,	,,	,,	,,
Shippers	42	0	,,	,,	,,	,,
Flettons	29	0	,,	,,	at railway depôt	
Red Wire Cuts	34	0	,,	,,	,,	,,
Best Fareham Red	71	6	,,	,,	,,	,,
Best Blue Pressed Staffordshire	85	0	,,	,,	,,	,,
Best Stourbridge Fire Bricks	84	0	,,	,,	,,	,,
Best White Glazed Stretchers	260	0	,,	,,	,,	,,
Headers	240	0	,,	,,	,,	,,
Quoins and Bull-nose	340	0	,,	,,	,,	,,
Double Headers	320	0	,,	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers	240	0	,,	,,	,,	,,
Quoins and Bull-nose	280	0	,,	,,	,,	,,
Double Headers	280	0	per thousand at railway depôt.			
Seconds Quality White and Dipped Salt Glazed	40	0	per thousand ess than best.			
Thames and Pit Sand	7	0	per yard, delivered			
Thames Ballast	6	6	,,	,,		
Best Portland Cement	34	0	per ton	,,		
Best Ground Blue Lias Lime	23	0	,,	,,		

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	12s. 6d.	per yard, delivered.
Stourbridge Fire-clay in sacks, 31s. 6d.	per ton at rly. dpt.	

STONE.

	s.	d.			
Ancaster in blocks	2	0	per ft. cube, deld. rly. depôt.		
Bath ,,	1	7	,,	,,	
Beer ,,	1	6½	,,	,,	
Grinshill ,,	1	10	,,	,,	
Brown Portland in blocks	2	2	,,	,,	
Darley Dale ,,	2	1½	,,	,,	
Red Corsehill ,,	2	5	,,	,,	
Red Mansfield ,,	2	4½	,,	,,	
Hard York ,,	2	10	,,	,,	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2	7	per ft. super. at rly. depôt.		
,, 6 in. Rubbed Ditto	2	10½	,,	,,	
,, 3 in. sawn both sides slabs (random sizes)	1	3	,,	,,	
,, ,, 3 in. self-faced Ditto	0	9	,,	,,	

SLATES.

in.	in.	£	s.	d.		
20×10	best blue Bangor	11	5	0	per 1000 of 1200 at rly. dep.	
,,	best seconds ,,	10	15	0	,,	,,
16×8	best ,,	6	2	6	,,	,,
20×10	best blue Portmadoc	10	18	0	,,	,,
16×8	,, ,,	6	0	0	,,	,,
20×10	best Eureka unfading green	11	2	6	,,	,,
16×8	,, ,,	6	15	0	,,	,,
20×10	Permanent green and Sedan green	10	0	0	,,	,,
16×8	,, ,,	5	12	6	,,	,,

TILES.

	s.	d.		
Best plain red roofing tiles	40	6	per 1,000 at rly. depôt.	
Hip and valley tiles	3	6	per doz.	,, ,,
Best Broseley tiles	47	6	per 1,000	,, ,,
Hip and valley tiles	4	0	per doz.	,, ,,

TO CORRESPONDENTS.

A. & W. R.—(Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Borough Asylum	Cardiff Corporation	Not stated	April 17

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Steel Gasholder, &c.	Ilminster Gas Company	Engineer, Gas Offices, Ilminster	April 10
House and Shop, Griffithstown, Pontypool	.....	T. Williams, Belmont, Victoria-road, Pontypool	do.
Alterations to Dispensary, 52, Charles-street	Cardiff Guardians	E. Seward, Architect, Queen's Chambers, Cardiff	do.
Six Houses, Wigton-road, Carlisle	.....	A. W. Johnston, Architect, 81, Castle-street, Carlisle	do.
Pipe Sewers, Bedlington	Bedlingtonshire U.D.C.	Cuthbert Brown, Bedlington	do.
Road Metal	Durham R.D.C.	G. Gregson, Surveyor, Council Offices	do.
Granite, Slag, &c.	Ely (Cambs.) R.D.C.	A. D. Eunals, Surveyor, Lynn-road, Ely	do.
Paving Works, Highfield-road, Pendleton	Salford Corporation	Borough Engineer, Town Hall, Salford	do.
Road Works, Highcliffe-road	Batley Town Council	Borough Surveyor, Market Place, Batley	do.
Road Works, Cornwall-road	Bedford U.S.A.	Borough Surveyor, Town Hall	do.
Drainage Works, &c., Kempston-road	do.	J. Lund, Borough Surveyor, Town Hall, Bedford	do.
Warehouse, Stabling, &c., William-street, Bury	.....	D. Hardman, Architect, Agur-street, Bury	do.
*Water Vans and Slop Carts	Plumstead Vestry	Engineer, Maxey-road, Plumstead	April 11
Building Works at Cemetery	Farnham Burial Board	S. Stapley, Architect, West-street, Farnham	do.
Building Work, Black Swan Inn, Alnwick	Alnwick Brewery Co., Ltd.	M. Temple Wilson, Architect, Alnwick	do.
Widening Bridge, &c., nr. Stockbridge, Westmorland	.....	County Surveyor, 7, Lowther-street, Kendal	do.
Wall, Palisading, &c., Railway Crescent, Bridlington	.....	Charles Gray, Town Hall, Bridlington	do.
Making-up George-street, Blackhill, co. Durham	.....	J. Dixon, Surveyor, Bank Buildings, Shotley Bridge	do.
Pipe Sewers (1,000 yards), Kneller-road, &c.	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall	do.
Road Works, Blakenall	Walsall Corporation	Borough Surveyor, Bridge-street, Walsall	do.
Paving Works, Church-street	Heckmondwike U.D.C.	J. Saville, Surveyor, Oldfield-lane, Heckmondwike	do.
Alterations to Infirmary	Cannock (Staffs.) Guardians	A. Veall, Architect, Darlington-street, Wolverhampton	do.
Water Mains	Skipton U.D.C.	J. Mallinson, Town Hall, Skipton	do.
Timber, &c.	Great Yarmouth U.S.A.	J. W. Cockrill, Civil Engineer, Borough Surveyor, Town Hall	do.
Road Widening, &c., William-street, Ystrad	Rhondda U.D.C.	W. J. Jones, Surveyor, Council Offices, Pentre, R.S.O., Glam.	do.
*Granite Setts	Plumstead Vestry	Engineer, Vestry Hall, Maxey-road, Plumstead	do.
*Wood Paving Works	Hammersmith Vestry	Surveyor, Town Hall, Hammersmith	do.
Additions, &c., to Farm Bldgs., Laes, Arbuthnott, N.B.	.....	A. W. Kinnear, Stonehaven, Aberdeenshire	April 12
Two Houses, &c., Racecommon-road, Barnsley	Bradford Prov. Indus. Soc. Ltd.	Wade & Turner, Architects, 10, Pitt-street, Barnsley	do.
Additions to Business Premises, Sunbridge-road, &c.,	Kettering Guardians	Rycroft & Firth, Architects, Manchester-road, Bradford	do.
Nurses' Home at Workhouse	Pontypool, &c., U.D.C.	Gotch & Saunders, Architects, Bank Chambers, Kettering	do.
Footbridge, Llantarnam	.....	R. Matthews, Surveyor, Cemetery House, Llantarnam	do.
Warehouse, &c., Blackwood-grove, Halifax	.....	M. Hall, Architect, 29, Northgate, Halifax	do.
Road Works, Kintyre, N.B.	Totnes R.D.C.	Jas. Lothian, District Clerk, Campbeltown	do.
Building Work near Churston Ferrers	Nelson Corporation	S. S. Rendle, Surveyor, Stoke Gabriel, Devon	do.
Cast-Iron Mains, &c., Brierfield	Wantage R.D.C.	A. Allan, Gas Engineer, Nelson	do.
Road Metal	Manchester Corporation	District Surveyor, East Ilsley, Berks.	April 13
Extension of Market, Water-street	Dundee Water Commissioners	City Surveyor, Town Hall, Manchester	do.
Cast-Iron Pipes, &c. (200 tons)	.....	G. S. Baxter, Engineer, 93, Commercial-street, Dundee	do.
Chapel, Seven Sisters, Neath	Committee	W. Williams, Architect, 63, Wind-street, Swansea	do.
Chapel at Asylum, Castlebar, Ireland	.....	E. K. Dixon, Civil Engineer, County Surveyor, Castlebar	April 14
Alterations to Manor House Inn, Shotley Bridge	Midsomer Norton U.D.C.	D. M. Spence, Architect, Ashmount, Shotley Bridge	do.
Limestone, &c.	Hoylake (Cheshire) U.D.C.	Surveyor, Market Hall, Midsomer Norton, Somerset	April 16
Road Materials	Shipstone-on-Stour R.D.C.	T. Foster, Surveyor, Council Offices, Hoylake	do.
C.I. Pipes, Junctions, &c.	Staffordshire County Council	J. E. Wilcox, Civil Engineer, Temple-row, Birmingham	do.
Road Metal, &c.	Lymington R.D.C.	J. Moncur, Surveyor, County Council Buildings, Stafford	do.
Bridge, Chewton, near Milton, Hants.	Mansfield Corporation	H. J. Weston, Civil Engineer, 24, Portland-street, Southampton	April 17
Making-up Newton-street, and others	Portland U.D.C.	Borough Surveyor, White Hart Chambers, Mansfield	do.
Sewerage Works (Contract No. 2)	Grand Theatre Company, Ltd.	E. J. Elford, Civil Engineer, New-road, Portland	do.
*Theatre at Llandudno	St. Martin's-in-the-Fields Vestry	G. A. Humphreys, Architect, Llandudno	do.
*Wharfage, Shoots, &c., for Disposal of Road, &c., Refuse	.....	Surveyor, St. Martin's Town Hall, Charing Cross-road	do.
Vicarage, Lightcliffe, Halifax	Lancs. County Council	J. F. Walsh & G. Nicholas, Architects, Halifax	April 18
Court Room, House, &c., Lytham	Rochester Corporation	H. Littler, Architect, County Offices, Preston	do.
Granite Kerbing, Cubes, York Paving, &c.	Masborough Equitable Pioneers' Soc	City Surveyor, Rochester	do.
Additions, &c., to Stores, Swallownest, nr. Rotherham	.....	Secretary, Masborough-street, Rotherham	do.
Schools, near Mooncoin, Kilkenny	.....	Rev. P. Phelan, Mooncoin, Kilkenny	April 19
*Parish Hall, Coalbrookdale	Walthamstow U.D.C.	Herbert Hughes, Coalbrookdale	do.
*Concrete Flags and Stone Coping	H.M. Office of Works	Surveyor, Town Hall, Walthamstow	do.
*Sorting Office, East Finchley	Worcester County Council	Lee & Sons, 35, Craven-street, W.C.	April 20
Road Cuttings, Embankments, &c., Tenbury	Birmingham Corporation	J. H. Garrett, Surveyor, Shire Hall, Worcester	do.
C.I. Storage Tank, &c., Green-lanes, Small Heath	Norwood (Middlesex) School Bd.	Engineer, Kent-street, Birmingham	April 21
*School	Goole U.D.C.	G. E. T. Lawrence, 22, Buckingham-street, Adelphi, W.C.	do.
*Well and Bore Hole, &c., Pollington	Romford Union	J. C. Meuiss, Engineer, 264, Gresham House, Old Broad-st., E.C.	April 23
*Laundry Machinery at Workhouse	Whitechapel Board of Works	See Advertisement	do.
*Electricity Supply Station	Woolwich Union	Engineer, 15, Great Alie-street, Whitechapel, E	April 24
*Nurses' Home at Infirmary	Croydon, &c., Joint Hospital Board	C. W. Brooks, 63, Finsbury-pavement, E.C.	April 25
*Hospital and other Works, North Cheam	Winchester Corporation	Chart, Son, & Reading, Architects, Croydon	April 26
*Public Baths	Essex and East Suffolk C.C.	See Advertisement	April 27
*Taking-down and Re-building Bridge, Dedham	.....	See Advertisement	April 28
*Church, Lancaster-road, Notting Hill	Edinburgh Gas Commissioners	C. J. Manor & Son, 29, Great George-street, S.W.	do.
Building Work at Gasworks, Granton	Aldershot U.D.C.	W. R. Herring, Engineer, Gasworks, Edinburgh	April 30
Sewerage Works	Mid-Lothian County Council	N. F. Dennis, Civil Engineer, 126, Victoria-road, Aldershot	do.
Steel Girder Bridge (300 feet in length), Edinburgh	Mountain Ash U.D.C.	Johnstone & Rankine, 238, West George-street, Glasgow	do.
*Sewage Farm, Straining Tanks, &c.	Bermondsey Vestry	See Advertisement	May 1
*Brickwork Chimney Shaft	Wolverhampton Corporation	Town Hall, Spa-road, Bermondsey	May 4
Tramway Rails	.....	J. W. Bradley, Civil Engineer, Town Hall	May 5
House, Chellow Dean, Allerton	.....	R. Drake, Architect, 142, Allerton-road, Allerton	No date
Seven Houses, Barnes	.....	J. Wilson & Co., Surveyor, 2, Church-parade, Barnes, Surrey	do.
Additions to School, London-road, Burgess Hill	Messrs. R. Harrison & Son	C. Botham, Architect, 20, West-street, Brighton	do.
Extension of Mart, Botchergate, Carlisle	.....	J. Graham, Architect, Bank-street, Carlisle	do.
Four Houses, Castleford	Mr. M. C. Beck	G. Hepworth, Wheldon-road, Castleford	do.
Two Houses, &c., Holmside, Chester-le-Street	.....	T. E. Crossling, Architect, Stanley, R.S.O.	do.
Building Work, St. Nicholas' Church, Newchurch, Lancs.	.....	F. J. Hobson, Architect, Rawtenstall	do.
Fourteen Houses, Hotspur-street, &c., Heaton	Mr. W. Peers	J. W. Dyson, Architect, 67, Grey-street, Newcastle-on-Tyne	do.
Mill, Irwell Bridge, Bury, Lancs.	Mr. W. Bentley	D. Hardman, Architect, Agur-street, Bury	do.
Three Houses, Bainbridge-road, Sedburgh, nr. Kendal	Shrewsbury School Board	J. Hutton, Architect, Kendal	do.
Cookery Centre and Alteration of Offices		A. E. Lloyd-Oswell, Architect, Dana Chambers, Shrewsbury	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Architectural Assistant	Bournemouth Corporation	See Advertisement	April 14
*Building Inspector	Edmonton U.D.C.	130*l.* per annum	April 17
*Surveyor's (second) Assistant	Hanley Corporation	80*l.* rising to 100*l.* per annum	April 19
*Clerk of Works	Essex County Council	3*l.* 3*s.* per week	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. lv. Contracts, pp. lv. vi. viii. x. & xxi. Public Appointments, pp. xviii. xix. & xxi.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

. Next week communications for insertion under this heading must reach us *not later than 10 a.m.* on Wednesday, as, owing to the Easter holidays, we go to press a day earlier than usual.

Denotes *accepted.* † Denotes *provisionally accepted.*

AYLESBURY.—For the supply of flints and gravel, for the Rural District Council :—

Flints (recommended for acceptance).

Parishes.		Cub. Yards.	Per Yard. s. d.
Aston Clinton (Upper)	James Dunton	100	4 3
Aston Clinton (Lower)	J. & W. Terry	180	5 10
Aston Sandford	Thomas Taylor	50	6 6
Bierton	Daniel Norris	35	6 3
Buckland (Upper)	Thomas Sills	100	3 10
Buckland (Lower)	J. & W. Terry	150	5 11
Cholesbury	Thomas Sills	80	3 10
Cuddington	Daniel Norris	70	7 0
Dinton	G. H. Darvill	100	6 5
"	Daniel Norris	150	6 5
Drayton Beauchamp (Upper)	William Baker	70	5 0
Drayton Beauchamp (Lower)	William Baker	140	5 9
"	Thomas Taylor	250	6 6
Haddenham	Jno. Sulston	20	7 0
Hardwick	Jno. Sulston	20	5 9
Hartwell	William Baker	150	3 9
Hawridge	John Sulston	80	6 3
Quarrendon	Joseph Franklin	100	5 4
Stoke Mandeville	Daniel Norris	100	6 2
Stone	Charles Miller	100	6 0
Weston Turville	J. & W. Terry	250	5 9

No tender for flints has been received for the following parishes, viz:—Chearsley, 50 yds.; Lower Winchenden, 50 yds.; and the Highways Committee recommend that 30 tons of granite at 11s. per ton and 35 tons at 11s. 5d. per ton be procured for these parishes respectively from Messrs. Bassano & Co.

Granite (recommended for acceptance).

The Enderby and Stoney Stanton Granite Company, Narborough, near Leicester, 390 tons at 11s. 4d. per ton, and 105 tons at 11s. 3d. per ton, and 280 tons at 11s. 1d. per ton; George Cannon, 30, High-street, Aylesbury, 370 tons at 11s. 3d. per ton; J. Jerome Large, Linslade, 60 tons at 11s. 4d. per ton; W. Bassano & Co., Rowley Hall Granite Quarries, Staffs., 25 tons at 11s. 5d. per ton, 60 tons at 11s. 4d. per ton, 360 at 11s. 2d. per ton, and 20 tons at 11s. per ton.

BRYN (Wales).—For the execution of sewerage works for the Margam Urban District Council. Mr. J. Cox, surveyor, Port Talbot :—

Barnes, Chaplin, & Co.	£1,786 0 0	John Davis	£1,420 0 0
Thomas Jenkins	1,710 0 0	Mark Thompson, Briton Ferry*	1,410 7 6
Thomas Taylor	1,599 6 7		

CHELMSFORD.—For alterations and additions to the London and County Bank. Mr. Pertwee and Mr. Frank Whitmore, joint architects :—

Brown & Son	£5,966	F. Johnson (too late)	£4,996
H. Porter	5,800	Moss & Co.	4,750
Kerridge & Shaw	5,470	Choate & Son	4,689
Coulson & Lofts	5,195	E. West, Chelmsford*	4,563
Silas Parmenter	5,087		

COVENTRY.—For the supply of granite, Foleshill, for the Rural District Council :—

Enderby and Stoney Stanton Granite Company, Narborough, near Leicester.

To be delivered at	Per ton broken. 2½ in. s. d.	1¾ in. s. d.	Chippings. s. d.	Unbroken stone. s. d.
Bedworth Railway Station	7 0	7 6	5 0	5 6
Foleshill Railway Station	7 4	7 10	5 4	5 10
Shilton " "	7 4	7 10	5 4	5 10
London and North-Western Railway Siding, London Road, Coventry	7 4	7 10	5 4	5 10

To be supplied from Enderby, Stoney Stanton, or Narborough.

Charles Abell, Hartshill granite quarries, near Atherstone.

To be delivered at.	Rate or price per ton, broken. 2 in. s. d.	1¾ in. s. d.	Chippings. s. d.	Unbroken stone. s. d.
Longford Canal Wharf	6 3	6 3	4 3	4 9
Stoke Heath Canal Wharf	6 3	6 3	4 3	4 9
Stowe Bridge Canal Wharf	6 6	6 6	4 6	5 0
Wyken Canal Bridge	6 6	6 6	4 6	5 0
Stoke Heath Canal Wharf	6 3	6 3	4 3	4 9

To be supplied from Hartshill.

DARTFORD (Kent).—For the erection of the Joyce Green Hospital (first section), for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities by Mr. W. T. Farthing :—

Mason Wells, & Co.	£259,580	Charles Wall	£228,350
Spencer, Santo, & Co. Ltd.	234,250	Patman & Fotheringham	227,500
McCormick & Sons	228,822	Leslie & Co., Ltd.*	222,459

DEVONPORT.—For the erection of parochial offices, Camel's Head, Devonport, for the Guardians. Mr. H. G. Luff, architect, 64, Chapel-street, Devonport. Quantities by Mr. J. Harvey, Courtenay-street, Plymouth :—

Thos. Jenkin & Son	£1,289 0 0	W. E. Blake	£1,111
Jillard & Stevenson	1,260 0 0	F. C. Ambrose	1,103
T. King	1,175 0 0	F. C. Widger	1,089
W. G. Goad	1,169 0 0	J. E. Carter, St. Budeaux*	1,050
Allen & Tozer	1,138 13 0	— Scott	821

EASTBOURNE.—For the erection of a mortuary for the Town Council. Mr. W. Chapman Field, architect, Town Hall, Eastbourne :—

Dennis & Co.	£527 10	F. Rich, 1 Fairlighter, Eastbourne*	£418 0
Cole & Sons	467 12		

EDMONTON.—For the erection of the Bowes-road Schools, N., for the School Board for Edmonton. Mr. H. W. Dobb, architect :—

	Amounts included in Tender for Gas Fitting. £ s. d.	Tar Paving and Playgrounds. £ s. d.
Godson & Son	19,550 0 0 .. 308 0 0	.. 2,297 0 0
Percival Hart	19,492 0 0 .. 279 2 6	.. 2,028 5 0
Knight & Son	18,348 0 0 .. 257 0 0	.. 1,956 0 0
Lawrence & Son, Waltham Abbey	18,149 0 0‡ .. 224 0 0	.. 2,083 0 0
Martin, Wells, & Co.	18,300 0 0 .. 340 0 0	.. 2,009 0 0
Newby Bros.	19,224 0 0 .. 268 0 0	.. 2,210 0 0
Arthur Porter	18,999 0 0 .. 227 0 0	.. 2,170 8 6

[Architect's estimate, £18,500.]

‡ Accepted subject to Education Department approval.

GARVAGH (Ireland).—For the erection of National School buildings, for Garvagh First Presbyterian Church Committee. Messrs. W. J. & M. Given, architects, Diamond, Coleraine :—

Maxwell & Co.	£921 19 0	Hugh McMullin, Union-street, Coleraine*	£600 0 0
J. McFarland	658 15 0		
W. Gould	658 2 6		

HALESOWEN.—For additions to house at Halesowen, for Dr. Young. Mr. A. T. Butler, architect, Cradley Heath :—

	Main Building. £	Bays. £	Total. £
J. M. Tate	671	100	771
Timmins & Son	639	88	727
J. A. Meredyth*	635	88	723

LONDON.—For the construction of engine-house, &c., Callis-yard, Union-street, Woolwich, for the Local Board. Mr. H. O. Thomas, Surveyor, Town Hall, Woolwich :—

C. Kitley	£510
Thomas & Edge, Woolwich*	498

LONDON.—For the execution of drainage and other works at infirmary, Lower-road, Rotherhithe, for the St. Olave's Union Guardians. Messrs. Newman & Newman, architects, 31, Tooley-street, S.E. :—

Pritchard & Renwick	£2,759	Gibb & Co.	£2,210
Beattie & Co.	2,725	Wells & Son	2,196
W. Reason	2,695	Baalam Bros., Old Kent-road*	2,188
Finch & Co.	2,667		
Barlow & Roberts	2,250		

LEICESTER.—For erecting Pike-street warehouses, Leicester. Mr. C. Kempson, architect. Quantities by the architect :—

F. Elliott	£2,314	T. R. Tebbatt	£2,183
W. M. Sharp	2,298	W. Jayes	2,159
Mason & Sons	2,268	A. Carr	2,143
W. Haddon	2,265	Carr Bros.*	2,132

[All of Leicester.]

LINCOLN.—For the erection of buildings at the Gasworks, Bracebridge, for the Corporation. Mr. R. A. MacBrair, Surveyor, Corporation Offices, Lincoln. Quantities by surveyor :—

Halkes Bros.	£4,380	W. & M. Halkes	£4,180
H. S. & W. Close	4,247	J. M. Harrison*	3,995

[All of Lincoln.]

LYMINGTON (Hants).—For the execution of paving works, for the Corporation. Mr. J. Pym-Jones, Borough Engineer, Town Hall, Lymington. Quantities by Borough Engineer and Surveyor :—

T. Rashley	£2,775 0 0	Free & Sons	£2,388 0 0
H. Preston	2,682 10 0	A. T. Catley	2,296 0 0
The Patent Victoria Stone Company	2,394 11 4	Grounds & Newton‡, Bournemouth	2,198 17 4

[Surveyor's estimate, £2,332 18s. 2d.]

‡ Recommended for acceptance.

MIDDLESBROUGH.—For the erection of Ayresome Schools, for the Middlesbrough School Board, providing accommodation for 1,270 children and for the caretaker's house. Mr. J. Mitchell Bottomley, architect, 28, Albert-road, Middlesbrough and Leeds.

G. Leeder & Son	£18,253 1 1	Waking	£15,993 3 1
S. Coates	16,918 8 1	W. Pounden	15,721 15 4
J. Johnson	16,264 0 0	G. Scales	15,696 0 0
		Allison Bros.	14,724 0 0

PRESTON.—For the erection of an annexe to the transit shed, Albert Edward Dock, for the Corporation. Mr. A. F. Fowler, Resident Engineer, Dock, Preston :—

Cartwell & Son, Park-road, Preston* .. £3,497 19

SPEKE (near Garston, Lancashire).—For the construction of a river wall, for the trustees of the late Richard Watt, of Speke Hall. Messrs. Charles H. Beloe and Frank E. Priest, MM.Inst.C.E., engineers. Quantities supplied :—

John Taylor, Garston, Runcorn stone	£3,000 0 0
" " Speke stone	3,700 0 0
Charles Burt, Liverpool, Runcorn stone	2,950 0 0
" " Speke stone	3,000 0 0
Elwy Williams, Rhyl, stone to be quarried by trustees	3,584 6 6
Holme & King, Liverpool, Runcorn stone*	2,329 7 10

WILLINGTON QUAY.—For the execution of paving works, Smeaton-street, for the Urban District Council. Mr. J. F. Davidson, engineer, Council Offices, Willington Quay :—

Geo. E. Simpson, Newcastle* ..... } Schedule
Ralph Maughan ..... } of
Jno. Worthy ..... } Prices.

WOKING.—For the erection of bottling stores and stabling, for Messrs. H. & G. Simonds, Limited, of the Brewery, Reading. Mr. William G. Jones, architect, Woking :—

J. Whitburn	£1,825	Drowley & Co.	£1,696
Harris & Son	1,773	G. Allard†	1,685

[All of Woking.]

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect :—

DULWICH HAMLET.—Manual training centre for twenty boys, with power of extension to forty, and art-room over :—

F. & H. F. Higgs	£2,328 0 0	Garrett & Son	£2,096 0 0
W. Downs	2,259 0 0	Akers & Co.	2,088 0 0
Thomas & Edge	2,211 0 0	A. J. Acworth	2,066 0 0
Holliday & Greenwood	2,128 16 1	Bulled & Co.	2,066 0 0
Rice & Son	2,124 0 0	H. Leney	2,066 0 0
Smith & Sons, Ltd.	2,116 0 0	J. & C. Bowyer	1,986 0 0
		E. Triggs*	1,980 0 0

Supply of Bench Cheeks and Stops for use in M.T. centres, on a running contract, for the London School Board :—

Articles.	H. Bouneau.‡	T. Cruwys.	The General Builders, Ltd.	G. M. Hammer & Co., Ltd.	W. H. Lascelles & Co.	London School Furniture Co.	T. J. Syer & Co.	Unsigned.
	s. d	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Bench Cheeks, Size No. 1 ..... each	1 1	1 5½	4 0	2 6	2 8	1 11	1 8	2 6
" " 2 ..... "	1 0	1 5	3 9	2 3	2 5	1 9	1 6	2 6
Bench Stops (oak or birch), Size No. 1 "	0 1½	0 2	1 0	0 3	0 4	0 3	0 3	0 4
" " " 2 "	0 2	0 3	1 3	0 4	0 4½	0 4	0 4	0 4
" " " 3 "	0 2½	0 3½	1 6	0 6	0 7	0 6	0 5	0 4

Supply of the following articles, on running contracts—Fireguards, gauze-covering, studs, and japanned scoops :—

Articles.	F. Bird & Co.	Buck & Hickman.	Carter & Aynsley, Ltd.	J. Clarke.	Rowland Hodges.	Pryke & Palmer.	G. W. Seymour.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Fireguards, 2 ft. 6 in. high ..... per ft. run	2 4	‡1 7½	3 0	3 9	4 5	5 10	2 11
Gauze covering for ditto ..... "	1 4	‡0 6½	2 0	1 0	1 5½	0 11	1 6
Wrought-iron studs for ditto, fixed complete ..... per pair	4 0	‡1 2	2 0	7 0	3 9	3 5	4 0
Japanned scoops ..... each	1 5½	10 9	1 3½	—	1 5½	‡0 11½	1 8

‡ Recommended for acceptance.

[See also next page.

GORDON HOUSE (Cottage Home).—Providing and fixing kitchener with oven and boot boiler, and running hot-water services to one bath, four lavatory basins, and two sinks, and providing one extra draw-off :—

J. Esson	£98 16	J. Wontner-Smith, Gray, & Co.	£83 0
The Brightside Foundry and Engineering Co., Limited	95 10	J. & F. May	82 10
Vaughan & Brown, Limited	90 0	Palowkar & Sons	78 0
		G. Davis	64 0
		Duffield & Co.*	59 10

GREAT WILD-STREET.—Providing and fixing sliding glazed partition to divide Room D, boys' department :—

London School Furniture Co.	£130 0 0	J. Stones	£103 11 0
J. Heywood	125 0 0	W. Martin	84 10 0
Bruce, Croom, & Co.	110 17 9	Wake & Dean, Limited*	74 0 0

HEAD OFFICES.—Providing three ledger desks, &c., and nest of drawers :—

The Bennet Furnishing Company*	£137 0
Newson & Co. (tender incomplete)	124 18

HOLLAND-STREET.—Providing and fixing hot-water coils for warming lobby and corridor on first, second, and third floors, in conjunction with tubular boilers :—

Cannon & Sons	£69 0	Knight & Sons	£53 0
Berry, Campbell, & Co.	66 10	G. & E. Bradley	49 15
Stevens & Sons	62 0	Morris & Co.	49 15
W. Simmons	59 18	G. Davis*	45 0

LOLLARD-STREET.—Cleaning interior of school :—

King & Son	£293 0	W. Hornett*	£193 0
H. & G. Mallett	197 15	J. F. Ford	164 10
Hooper & Son	193 0		

LYHAM-ROAD.—Swimming bath, including offices, laundry, &c. :—

W. Downs	£7,490	F. & H. F. Higgs	£6,904
E. P. Bulled & Co.	7,299	Holliday & Greenwood	6,890
J. Appleby	7,156	Edwards & Medway	6,741
J. Garrett & Son	7,148	J. & C. Bowyer	6,650
H. Wall & Co.	7,011	A. White & Co.	6,543
W. H. Lorden & Son	6,988	Unsigned	6,530
W. J. Mitchell & Sons	6,970	E. Triggs*	6,338

Repairs to buildings on the Schedule of Prices.

MARYLEBONE—Groups 1 and 2.

	Group 1.	Group 2.
General Builders, Ltd.	+35 p.c.	+35 p.c. on Schedule
G. Neal	+33⅓ ,,	+33⅓ ,, ,,
Thompson & Beveridge	+27½ ,,	+27½ ,, ,,
W. R. & A. Hide	+27½ ,,	+25 ,, ,,
Stevens Bros.	+25 ,,	+27½ ,, ,,
C. & W. Hunnings	+25 ,,	+25 ,, ,,
M. Pearson	+25 ,,	+25 ,, ,,
Bristow & Eatwell	+20 ,,	*+20 ,, ,,
J. W. Dixon	*+20 ,,	+20 ,, ,,

ROCHELLE-STREET.—Planting trees, shrubs, &c. :—

A. Durrant	£7 12 0	J. H. Judge	£4 19 6
Cutbush & Son	7 0 0	R. Neal*	3 18 0

RUBY-STREET.—Clearing away the existing block of offices in centre of playground, erecting new offices for boys, girls, and infants against the boundary wall, in order that if halls are at any time provided they may not be in the way ; refitting lavatories and providing new drainage scheme :—

J. W. Falkner & Sons	£2,474	J. & C. Bowyer	£2,234
Lathey Bros.	2,469	F. Bull*	2,050
W. Akers & Co.	2,325	Martin, Wells, & Co., London and Aldershot	1,724
W. Downs	2,304		

UPTON HOUSE.—Enlargement.—Ground Floor—Providing hall, plunge bath with dressing-room, spray bath, extending existing lavatory, providing new store-room and water-closet for officers ; and enlarging existing boiler-room. First Floor—Providing sitting and bedrooms for schoolmaster and matron ; extending dormitory, and providing bedroom for labour master ; and enclosing, draining, and tar-paving the additional land :—

Leslie & Co., Ltd.	£7,593 0	W. Shurmur	£7,036 0
Williams & Son	7,409 0	T. L. Green	7,031 0
Miskin & Sons	7,300 0	Wall & Co.	6,992 0
Lawrence & Sons	7,253 0	Willmott & Sons	6,926 0
Snewin Bros. & Co.	7,191 0	Chessum & Sons	6,735 5
Staines & Son	7,048 0	C. Cox*	6,699 0

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